B 880,574

# REPORT ON
# JAPANESE ASSETS
# in
# MANCHURIA
# to the
# PRESIDENT OF THE UNITED STATES

July, 1946

CLASSIFICATION
Changed to
UNCLASSIFIED

by authority of
AH McAllister
By
Date Aug 8, 1949

By

EDWIN W. PAULEY
Ambassador of the United States
and
Personal Representative of the President
on Reparations

HC
428
.M13
P33

# JAPANESE TRADE STUDIES

# KWANTUNG LEASED TERRITORY

## A Brief Summary of its Economy

Prepared for the
Foreign Economic Administration
by
George D. Watrous, Jr.
a member of the staff of the
United States Tariff Commission

August 1945

# [illegible]

The geographical position of Kwantung on the tip of the Liaotung Peninsula and the fact that its largest city, Dairen, is also the principal port of Manchuria, makes it of importance in connection with any postwar plans for the settlement of Far Eastern affairs.

The following material has been assembled with the idea of providing in convenient form some basic information with respect to the economy of the territory. While not an exhaustive study of Kwantung, it may be of timely interest.

The present report is one of a number which were prepared during 1944 and 1945 for the Foreign Economic Administration by members of the staff of the United States Tariff Commission. Owing to the desire of the Foreign Economic Administration to obtain this material as promptly as possible, the reports were not reviewed by the Tariff Commission. All statements of fact or opinion in these reports are attributable to the individual staff members who prepared them. The reports were originally intended for confidential use of Government agencies, but are now being made public with the consent of the Foreign Economic Administration.

## CONTENTS

Page

Introduction ---------------------------------------- 1
Area and population ---------------------------------- 1
Agriculture and livestock ---------------------------- 1
Industry --------------------------------------------- 2
Foreign trade ---------------------------------------- 2
Trade with Manchoukuo -------------------------------- 3
Principal cities - Dairen ---------------------------- 7
- Port Arthur ---------------------- 8

## Tables

Table 1.- Value of industrial production in Manchoukuo and Kwantung, 1936 ------------------ 2
Table 2.- Principal imports into the Manchoukuo customs district of Dairen that were retained in the Kwantung Leased Territory, 1936 ------------------ 4
3.- Products of Kwantung that crossed the border from Leased Territory into Manchoukuo, 1936 ---------- 6
Merchandise arriving in Kwantung Leased Territory, 1936 ------------------ 7

# KWANTUNG LEASED TERRITORY
## A Brief Summary of its Economy

### Introduction

Kwantung, or Kwantung Leased Territory (sometimes incorrectly referred to as Kwantung Province) is that portion of Manchuria on the southern tip of the Liaotung Peninsula over which Russia obtained jurisdiction from China prior to the Russo-Japanese War. Under the Treaty of Portsmouth (1905) the Russian lease and her vested rights were transferred to Japan with the consent of China. A treaty between China and Japan in 1915 extended the lease of Kwantung and the South Manchuria Railway Zone for 99 years. Under the terms of an earlier agreement between Japan and China in 1907 the entire leased area became a free zone but this arrangement is believed to have been terminated with the organization of Manchoukuo in 1932. By the release of the extraterritorial rights of Japan in November 1937 Kwantung came entirely under the jurisdiction of Manchoukuo.

### Area and population

Kwantung with an area of 1,337 square miles and the South Manchuria Railway Zone with 115 square miles, are together a little larger than the State of Rhode Island. Their combined population of 1,656,726 (1935) is about that of Connecticut.

### Agriculture and livestock

Kwantung, like Manchoukuo, is primarily an agricultural area. The principal crops are maize, peanuts, kaoliang, millet, beans and so forth. Production of fruits amounted to almost 18,000 metric tons in 1936, the principal varieties being grapes, peaches, apples, and cherries. Vegetable production amounted to 126,439 metric tons in 1936 the more important varieties being Chinese rape, turnips, sweetpotatoes and cucumbers. Special crops in addition to the above consist of cotton, castorbeans, sesame seed, tobacco and so forth.

The Government has a 30-year plan for sheep raising in Manchoukuo and Kwantung by which it is planned to increase the number of sheep in Kwantung from 4,400 in 1937 to 120,000 in 1967 and the wool production from about 26,000 pounds to 840,000 in the same period. The Government has a stock-breeding station in the Territory and has encouraged forestry with nurseries aggregating 1,000 acres. At the end of 1936 about 346 square miles of Kwantung, about a fourth of the total, were in forests.

With large fishing areas and nearby markets there has been great recent development of the fisheries. In 1936 there were about 6,000 fishing craft, chiefly sampans, and the value of the catch was 5.8 million yen. In the same year the value of marine manufactures was 850 thousand yen.

## Industry

In 1936 Kwantung continued to be a more important industrial center than Manchoukuo, with production valued at 470.5 million yen and 335.4 million yen for the two areas, respectively. The value of production, by industry groups, in Kwantung and Manchoukuo in 1936 is shown in table 1.

Table 1.- Value of industrial production in Manchoukuo and Kwantung, 1936

(In million yen)

| Industry | Manchoukuo | Kwantung | Total |
|---|---|---|---|
| Metallic | 23.3 | 128.6 | 151.9 |
| Chemical | 44.5 | 122.8 | 167.2 |
| Provision | 110.9 | 54.8 | 165.7 |
| Textile | 70.2 | 40.8 | 111.0 |
| Machines and tools | 10.2 | 40.2 | 50.4 |
| Ceramic | 11.4 | 17.0 | 28.4 |
| Lumber and woodworking | 14.6 | 10.3 | 24.9 |
| Printing and bookbinding | 7.4 | 7.6 | 15.0 |
| Miscellaneous | 42.9 | 29.4 | 72.3 |
| Total | 335.4 | 470.5 | 805.9 |

Source: Japan-Manchoukuo Yearbook, 1939.

The foreign trade statistics of Manchoukuo discussed in the following section indicate the existence of a petroleum refinery in Kwantung since they show rather large imports of crude oil and shipments across the border into Manchoukuo of refined oils.

## Foreign trade

(All values in this section are in millions and tenths of millions of Manchoukuan Yuan, i.e. 00,000 are omitted. Chinese and Manchoukuan exchange rates constitute a difficult problem and it has seemed better not to attempt any conversion to United States currency. Manchoukuan foreign trade statistics convert Customs Gold Units to Manchoukuan Yuan at the rate of one unit to 1.95 Manchoukuan Yuan; taking the Chinese Gold Unit as worth $0.677 in 1935 this would seem to indicate a value of about $0.35 for one Manchoukuan Yuan. This figure is given as an approximation only and should not be construed as a statement of the Tariff Commission that it is the correct rate for conversion.)

Kwantung is considered by Manchoukuo to be an integral part of Manchoukuo so far as foreign trade is concerned and there are no official statistics of the trade of Kwantung with foreign countries. The Annual Returns of the Foreign Trade of Manchoukuo show imports into Manchoukuo by customs districts of which Dairen (in Kwantung) is one, and in addition show the amount of each imported commodity that is transferred across the border from Kwantung Leased Territory into Manchoukuo. From these statistics the quantity and value of imports from foreign countries that are retained in Kwantung, as well as the character and amount of Kwantung products sent into Manchoukuo can be determined.

In 1936 the total value and the principal sources of foreign goods apparently retained in Kwantung were as follows:

| | Million Manchoukuan Yuan |
|---|---|
| Total | 255.9 |
| Japan | 198.4 |
| United States | 11.3 |
| China | 9.6 |
| Korea | 5.0 |
| Netherlands India | 4.7 |
| Germany | 4.7 |
| British India | 4.5 |
| Great Britain | 3.9 |

Goods valued at 270.3 million Manchoukuan Yuan, imported into the customs district of Dairen from foreign countries, crossed the border from Kwantung into Manchoukuo in 1936 in addition to goods valued at 59.3 million the product of Kwantung. (See table 3.)

The imports retained in Kwantung in 1936 are shown in table 2 by commodity groups and principal commodities.

There are no statistics available to show the exports of Kwantung products to foreign countries. Dairen, the principal port through which the native products of Manchoukuo are shipped, accounted for 374 million Manchoukuan Yuan in 1936 out of a total of 529 million exported from Manchoukuo, but products of Kwantung are not segregated from those of other regions.

## Trade with Manchoukuo

The principal products that crossed the border from Kwantung Leased Territory into Manchoukuo and that originated in Kwantung were changed in form (or otherwise advanced in value within that area) are shown in table 3.

### Table 2.- Principal imports into the Manchoukuo customs district of Dairen that were retained in the Kwantung Leased Territory, 1936

(Values in millions and tenths of millions of Manchoukuo Yuan, i.e.00,000 omitted)

| Commodity group and commodity | Value of imports, 1936 | |
|---|---|---|
| | From all countries | From principal countries 1/ |
| Total | 255.9 | - |
| Cotton piece goods, grey | 5.4 | 5.0 |
| Shirtings and sheetings, grey | 4.2 | 3.9 |
| Cotton piece goods, white or dyed | 17.2 | 17.1 |
| Shirtings, sheetings and Irishes, white | 3.4 | 3.3 |
| Serges and gabardines, plain | 6.9 | 6.9 |
| Cotton piece goods, printed | 4.9 | 4.9 |
| Wool and manufactures thereof | 9.8 | 9.0 |
| Serges, twills and imperials | 3.0 | 2.9 |
| Woolen piece goods mixed with other fibers except silk, n.o.r. 2/ | 4.9 | 4.1 |
| Silk (including artificial silk) and manufactures thereof | 44.9 | 43.0 |
| Artificial silk floss and yarn | 15.8 | 14.4 |
| Piece goods of artificial silk and veg.fiber | 18.4 | 18.3 |
| Metals and ores | 16.0 | 12.6 |
| (No single large item. A considerable amount of the trade is in semimanufactures of iron and steel) | | |
| Machinery and tools | 5.5 | 3.9 |
| Machinery and parts, n.o.r. | 2.8 | 1.8 |
| Vehicles and vessels | 26.7 | 26.0 |
| Locomotives and tenders | 11.2 | 11.2 |
| Railway or tramway materials, n.o.r. | 10.3 | 9.9 |
| Miscellaneous metal manufactures | 8.8 | 6.9 |
| Insulated wire, including vulcanized wire and flexible cord | 2.2 | 2.2 |

See footnotes at end of table.

Table 2.- Principal imports into the Manchoukuo customs district of Dairen that were retained in the Kwantung Leased Territory, 1936-Continued

(Values in millions and tenths of millions of Manchoukuo Yuan, i.e,00,000 omitted)

| Commodity group and commodity | Value of imports, 1936 | |
|---|---|---|
| | From all countries | From principal countries 1/ |
| Animal products, canned goods, and groceries | 4.4 | 3.3 |
| Cereals and flours | 14.3 | ( 4.8<br>(A. 3.7<br>(C. 2.8 |
| Rice and paddy | 5.1 | (C. 2.4<br>(S. 1.1 |
| Wheat flour | 8.8 | ( 4.6<br>(A. 3.7 |
| Fruits, seeds, and vegetables | 5.4 | 4.1 |
| Sugar | 19.8 | ( 14.3<br>(N.I. 3.6 |
| Wine, beer, spirits, table waters, etc. | 5.1 | 4.1 |
| Sake in bottles or barrels | 2.0 | 2.0 |
| Chemicals and pharmaceuticals | 4.5 | 3.4 |
| Candles, soap, oils, fats, waxes, gums, and resins | 11.4 | (U.S. 6.1<br>( 2.7 |
| Crude oil, mineral | 6.6 | U.S. 4.6 |
| Books, maps, paper and wood pulp (No single large item.) | 7.2 | 5.9 |
| Timber | 5.1 | ( 2.8<br>(U.S. 1.7 |
| All other | 39.5 | |

---

1/ From Japan unless otherwise indicated. A-Australia, C-China, S.Siam, U.S.-United States, N.I.-Netherlands Indies.

2/ N.o.r. means "not otherwise reported."

Source: Prepared by U. S. Tariff Commission from Annual Returns of the Foreign Trade of Manchoukuo, 1936, part 1, table 12.

Table 3.- Products of Kwantung that crossed the border from Kwantung Leased Territory into Manchoukuo, 1936

(In millions and tenths of millions of Manchoukuo Yuan, i.e., 00,000 omitted)

| Commodity | Value |
|---|---|
| Total | 59.3 |
| Cotton shirtings, sheetings, and pongees, dyed, plain | 1.3 |
| Cotton yarn, gray | 5.9 |
| Yarn, thread, cordage, twine and rope | .3 |
| Steel sleepers, fish plates, spikes, bolts, and nuts, for use with rails | 1.3 |
| Galvanized iron and steel wire | .4 |
| Structural sections or building forms or iron or steel, fabricated for use | .5 |
| Machinery and parts, n.o.r. | .7 |
| Locomotives and tenders | 9.5 |
| Railway or tramway carriages or wagons | 11.0 |
| Railway or tramway materials, n.o.r. | 2.2 |
| Apples, fresh | .5 |
| Gasoline, naphtha, and benzine, mineral | 8.3 |
| Liquid fuel | 2.7 |
| Kerosene | 5.6 |
| Paraffin wax | .4 |
| Paper, Chinese type | .3 |
| Window glass, common | 1.2 |
| Cement | .4 |
| All other articles | 6.8 |

Source: Compiled from Annual Returns of the Foreign Trade of Manchoukuo, 1936, part 1.

The movement of merchandise into Kwantung from Manchoukuo for consumption in Kwantung is not reported. The quantity of goods arriving in Kwantung Leased Territory by railway (presumably from Manchoukuo) is given in table 4 but there is no means of telling how much of this was for export to foreign countries and how much for home consumption in Kwantung.

Table 4.- Merchandise arriving in Kwantung Leased Territory by railway, 1936

(In metric tons)

| Commodity | Quantity |
|---|---|
| Total | 8,348,677 |
| Coal | 4,766,570 |
| Soybeans | 2,166,783 |
| Iron and steel | 306,390 |
| Perilla seeds | 150,846 |
| Kaoliang | 100,530 |
| Beans, other than soy | 94,295 |
| Bean cake | 72,966 |
| Shale oil | 72,386 |
| Maize | 65,703 |
| Wheat bran | 60,038 |
| Hemp seed | 56,862 |
| Stone | 50,661 |
| Sulphate of ammonium | 32,237 |
| Wood | 28,216 |
| Peanuts | 25,130 |
| Rice and paddy | 24,675 |
| Iron and steel manufactures | 21,334 |
| Wax and candles | 21,195 |
| All other commodities | 231,860 |

Source: Compiled from Annual Returns of the Foreign Trade of Manchoukuo, 1936, part 1, table 18.

Principal cities - Dairen

Dairen (Dalny), situated near the southern end of the Liaotung Peninsula, is not only the largest city in Kwantung (population about 550,000 in 1937) but is the principal port through which the foreign trade of Manchoukuo passes. It is the southern terminus of the South Manchuria Railway which has jurisdiction over all harbor facilites and an interest in many of its economic affairs. Staple exports through Dairen are soybeans, bean cake, bean oil, coal, and cereals, while imports are mainly miscellaneous goods.

In 1936, 4,988 ships with a tonnage of 13,851,000 entered Dairen, of which 3,192 with tonnage of 8,760,000 were Japanese.

# JAPANESE TRADE STUDIES

# KWANTUNG LEASED TERRITORY

## A Brief Summary of its Economy

Prepared for the
Foreign Economic Administration
by
George D. Watrous, Jr.
a member of the staff of the
United States Tariff Commission

August 1945

The tonnage of goods handled at Dairen, in 1933, by principal articles, was as follows:

| Goods loaded | 1,000 metric tons |
|---|---|
| Total | 6,874 |
| Coal 1/ | 2,808 |
| Soybeans | 1,986 |
| Bean cake | 693 |
| Pig iron | 410 |
| Kaoliang | 64 |
| Peanuts | 76 |
| "Other grains and seeds" | 366 |
| Bean oil | 67 |
| All other commodities | 404 |

---

1/ Not including bunker coal, 720,180 tons.

| Goods landed | 1,000 metric tons |
|---|---|
| Total | 2,170 |
| Iron and steel manufactures | 316 |
| Wheat flour | 291 |
| Timber | 184 |
| Oil and fat | 122 |
| Cement | 111 |
| Sugar | 88 |
| Paper | 84 |
| Cotton yarn and cloth | 73 |
| Vehicles | 62 |
| Gunny bags | 54 |
| All other commodities | 785 |

## Principal cities - Port Arthur

Port Arthur (Ryojun) with a population of about 140,000 in 1937 is not very important for commerce. It is said to be the only ice-free po in Manchoukuo. Goods loaded in 1933, in thousands of metric tons were: Total 179, coal 131, salt 33, and silica 15. In addition about 20,000 tons of bunker coal were loaded. Salt was almost the only commodity lan with a tonnage of 34,000 out of a total of 35,000.

The principal products of the region are vegetables, peaches, pears silk yarns and piece goods, alt and poultry.

Other cities are Pulantien, the northernmost town of the Territory, with a population of 187,000 in 1937 and Chinchou with a population of 136,000.

Trade of Japan with Manchoukuo and Kwantung

The relative position of Kwantung as respects the foreign trade of Japan was as follows:

(In million yen)

| | 1935 | 1936 | 1937 |
|---|---|---|---|
| Exports from Japan: | | | |
| To all foreign countries | 2,499 | 2,693 | 3,175 |
| To Asia | 1,304 | 1,371 | 1,646 |
| To Manchoukuo | 126 | 151 | 216 |
| To Kwantung | 300 | 347 | 396 |
| Imports into Japan: | | | |
| From all foreign countries | 2,472 | 2,764 | 3,783 |
| From Asia | 870 | 1,060 | 1,295 |
| From Manchoukuo | 191 | 206 | 249 |
| From Kwantung | 26 | 34 | 45 |

It is not known how much of this trade with Kwantung was really with other portions of Manchoukuo.

Gift
U.S. Dept of State
1-20-50

THE WHITE HOUSE
WASHINGTON

November 12, 1946

The President

The White House

Dear Mr. President:

Under your instructions to me contained in your letter of April 27, 1945, and subsequent verbal orders you have issued to me, I present to you a report on Japanese assets in Manchuria.

This is a factual report based primarily on the first-hand observations and consultations with informed persons by myself and my Mission in Manchuria in June and July. In addition studies were made and appropriate personnel consulted in Washington and Tokyo prior to the arrival of our Mission in Manchuria.

It would not have been possible to carry through this assignment without the aid and assistance which was received from the Secretary of State and the Secretaries of the War and Navy Departments, and especially from General Douglas MacArthur and General George C. Marshall in the Orient. The Chinese National Government was most helpful in facilitating the activities of my Mission throughout areas under its control. In the Communist-held areas in North Manchuria, Chinese Communist and Soviet Railway officials were also of help.

Sincerely yours,

Edwin W. Pauley

EDWIN W. PAULEY

# TABLE OF CONTENTS

Page

General Staff of the United States Reparations Mission i

Log of the Mission iii

Chapter I. General Summary 1

II. Development and Destruction of Manchuria's Economy 16

III. Electric Power 54

IV. Coal 72

V. Iron and Steel 87

VI. Railways 126

VII. Metal Working Industry 141

VIII. Non-Ferrous Mining and Metal Industries 149

IX. Liquid Fuel and Lubricant Industry 162

X. Chemical, Food and Allied Industries 184

XI. Cement Industry 209

XII. Textiles 220

XIII. Paper and Pulp 226

XIV. Lumber 233

XV. Radio, Telephone and Telegraph 237

XVI. Precious Metals, Currency and Securities 243

XVII. Records and Files 247

Appendices

NOTE: Appendices 1 through 14 contain Plant Inspection Reports and other pertinent data. See List of Appendices.

3

## GENERAL STAFF OF THE UNITED STATES REPARATIONS MISSION

(MAY TO SEPTEMBER, 1946)

EDWIN W. PAULEY
Ambassador of the United States
and
Personal Representative of the President on Reparations

MARTIN TOSCAN BENNETT*
Chief of Staff

JOSIAH DUBOIS
Counsel

JOHN P. HURNDALL*
Deputy Chief of Staff

A. B. EINIG*
Mechanical Industries

RICHARD SACHSE
Advisor on Power

NORMAN CLEAVELAND*
Mining Industries

CARLETON B. SWIFT*
Power & Communications

NORMAN M. TAYLOR*
General Industries

H. M. THORNE*
Petroleum & Chemical Industries

EDWIN M. MARTIN*
Economist

B. S. BERCOVICI*
Editor

J. PAULL MARSHALL*
Analyst

ERNEST L. KLEIN*
Special Assistant

GEN. G. F. SCHULGEN*
Military Advisor

E. L. SHANER*
Steel & Metal Industries

LUTHER GULICK
Advisor on Administration

COL. W. MAYER*
Advisor on China

N. M. ELIAS*
Chemical Industries

JUSTIN R. WOLF
Washington Liaison

LAWRENCE RICHARDSON
Transportation

GAIL S. CARTER*
Chief of the Secretariat

CAPT. MARLIN E. FENICAL*
Official Photographer

RICHARD P. GAYNOR*
Secretariat

RAPHAEL W. GREEN*
Secretariat

CHARLES A. KARL*
Secretariat

BENJAMIN C. OLSEN*
Secretariat

SGT. JOHN MATLES*
Interpreter

* Accompanied Ambassador Pauley into Manchuria

# PERSONNEL TEMPORARILY ASSIGNED TO U. S. REPARATIONS MISSION BY GENERAL OF THE ARMY DOUGLAS MACARTHUR, SUPREME COMMANDER FOR THE ALLIED POWERS, AS ENGINEERS AND CONSULTANTS

Lt. Col. Herbert G. Schenck

Captain Carl Ross

Captain A. Santelli

Captain Earl M. Scott

2nd Lt. H. A. Fisher

Thomas A. Hendricks

Theodore L. Johnston

## LOG OF THE MISSION

## BRIEF HISTORY OF THE UNITED STATES REPARATIONS MISSION TO MANCHURIA

(May to July, 1946)

| EVENTS | DATES |
|---|---|
| Staff conference and final briefing of all members of the Mission as to respective duties and discussions of certain significant phases of the work. | April 30, 1946 |
| Following members of the Mission left Washington, D. C. for Los Angeles, California on the first leg of the journey to Tokyo, Japan: Martin T. Bennett, B. S. Bercovici, Gail S. Carter, Alvin B. Einig, Captain Marlin E. Fenical, Richard P. Gaynor, Raphael W. Green, John P. Hurndall, Charles A. Karl, Ernest L. Klein, Edwin M. Martin, First Sergeant John Matles, Colonel William Mayer, Benjamin C. Olsen, Brigadier General George F. Schulgen, Earl L. Shaner, Carleton B. Swift, Jr., Norman M. Taylor, and Harold M. Thorne. | May 4, 1946 |
| Mr. Pauley joined the Mission in Los Angeles and the major portion of the Mission departed San Francisco for Hawaii. | May 7, 1946 |
| At Honolulu, T. H., Mr. Pauley met Admiral John Towers and General Moore and conferred, at President Truman's request, with Honorable Herbert Hoover about the possible coordination of the Reparations Plan with the world food problem. | May 8, 1946 |

A temporary office for the Mission was established at the Mitsui Club, Tokyo, Japan. . . . . . . . . . . . . . May 10, 1946

Mission consulted with appropriate members of General Macarthur's Staff and reviewed all information available at Tokyo. . . . . . . . . . . . . . . . . . . . . . May 11 - 15, 194

A meeting of the staff of the Mission was held at the Mitsui Club, Tokyo. The staff was briefed by Mr. Pauley and General Marquat on policy, operational and data source gathering facilities. The Ambassador announced the appointment of Martin Toscan Bennett as Chief of Staff of the Mission.

Mr. Pauley met with General Douglas MacArthur at the Dai Ichi Building.

Mr. Pauley and the technical experts attached to the Mission attended a further briefing on Korea and Manchuria at General Willoughby's office. . . . . . . . . . . . . . . May 11, 1946

Mr. Pauley met with General Dwight Eisenhower and attended a review of U. S. Army troops in the General's honor on the Imperial Palace grounds. . . . . . . . . . . . . . May 12, 1946

Mr. Pauley and a part of the staff proceeded to Seoul, Korea where a base of operations was set up for the inspection of the Soviet occupied territory in Korea north of 38°. . May 16, 1946

Mr. Pauley met with Lt. General John R. Hodge, Commanding General, U. S. Forces in Korea, and discussed the preparation for the Mission's entry into the Soviet occupied territory north of the 38th Parallel.

Mission briefed by appropriate sections of General Hodge's staff, and detailed data secured on Korean trade and industry while awaiting results of negotiations to enter northern Korea. . . . . . . . . . . . . . . . . . . May 17 - 28, 1946

The portion of the Mission that had remained in Tokyo proceeded to Seoul, Korea, accompanied by eight technicians assigned to the Mission by General Douglas MacArthur. . . . . . . . . . . . . . . . . . . . . . . . May 18, 1946

Mr. Pauley and members of the Mission made a tour of inspection of the vicinity of Seoul. . . . . . . . . May 22, 1946

Three additional members of the staff proceeded direct from Washington to Seoul to join the Mission: Nathaniel M. Elias, Norman Cleaveland, and J. Paull Marshall. . . . . . . . . . . . . . . . . . . . . . . . . . May 23, 1946

Mr. Pauley proceeded to Nanking, China and conferred with General George C. Marshall and various officials of the Chinese Government about the Mission's planned inspection of Manchuria. . . . . . . . . . . . . . May 24, 1946

Mr. Pauley proceeded to Peiping, China to confer with Walter Robertson, American Minister at Peiping and U. S. Army officials about the Mission's planned inspection of Manchuria. Colonel William Mayer was designated by Mr. Pauley to act as Liaison Officer between the Mission and General Marshall's staff and the Chinese Government in setting up arrangements for the Mission's

▼

inspection of Manchuria. . . . . . . . . . . . . . . . May 25, 1946

Mr. Pauley proceeded to Shanghai to confer with Admiral Cook and General Gillem about the Mission's planned inspection of Manchuria. . . . . . . . . . . May 27, 1946

Mr. Pauley left Shanghai and returned to Seoul in readiness for entry of Mission into northern Korea. May 28, 1946

Colonel Mayer proceeded to Mukden to set up the base for the Manchurian survey. . . . . . . . . . . . May 29, 1946

Advance group of Mission under Colonel Schenck arrived at Mukden from Seoul. . . . . . . . . . . . . May 31, 1946

Mission parties headed by Colonel Schenck, Mr. Hendricks, Mr. Johnston, Captains Ross, Santelli, and Scott made a survey of the Mukden industrial area. June 1 - 8, 1946

Mission parties headed by Colonel Schenck, Mr. Thorne, Mr. Martin, Mr. Shaner, and Mr. Cleaveland inspected the Fushun area. . . . . . . June 3 - 4, 1946

Additional Mission group arrived at Mukden from Korea and inspection of the Mukden area was continued. Mr. Hurndall assumed charge of the Mission.. June 6, 1946

Balance of Mission, less Mr. Pauley (in hospital at Seoul) and three members of the Secretariat, arrived at Mukden. Mr. Bennett, Chief of Staff, took charge of operations in Manchuria and proceeded with inspection of Mukden area. . . . . . . . . . . . . . . . June 7, 1946

Mission party headed by Mr. Hendricks, Mr. Martin, and Mr. Thorne inspected the Chinchow area. . . . . June 7 - 8, 1946

Mission parties headed by Mr. Cleaveland and Mr. Swift inspected Fouhsin and Peipiao coal mining area. . . . . . . . . . . . . . . . . . . . . . . June 8 - 9, 1946

Mission parties headed by Mr. Hendricks, Mr. Martin, and Mr. Thorne inspected Chinhsi and Yanchatantsi areas. . . . . . . . . . . . . . . . . . . . June 9 - 10, 1946

Mission parties headed by Mr. Thorne and Mr. Martin inspected Hulutao area. . . . . . . . . . . June 9, 1946

Mission parties headed by Mr. Hurndall, Mr. Johnston, Mr. Taylor, Mr. Elias, Mr. Shaner, and Mr. Einig inspected Liaoyang, Penchihu, and Anshan areas. . . . . . . . . . . . . . . . . . . . . . . June 9 - 13, 1946

Mr. Pauley and the remaining members of the Mission proceeded to Mukden to join the members of the Mission already there. . . . . . . . . . . June 14, 1946

Mr. Pauley met with O. Edmund Clubb, American Consul at Mukden and Dr. Chang Kia-Ngau, Chairman, North Eastern Economic Commission. . . . . . . . . June 14, 1946

Mr. Pauley and portions of his staff visited various areas in Manchuria. . . . . . . . . . . . . June 15 - 19, 1946

Mission parties under Mr. Cleaveland, Mr. Hendricks, Mr. Thorne, and Capt. Scott inspected industrial installations at Kaiyuan, Ssupingchieh, Hsian, and Changtu. . . . . . . . . . . . . . . . . June 15 - 17, 1946

Mr. Pauley and a portion of his staff inspected the industrial complex in the Mukden area and then proceeded to Fushun, Manchuria for a similar inspection of that area. . . . . . . . . . . . . . . . . . June 16, 1946

Mr. Pauley and a portion of his staff inspected the industrial installations at Fushun and Liaoyang areas, Manchuria. . . . . . . . . . . . . . . . . . . June 17, 1946

Mr. Pauley and a portion of his staff inspected the Anshan area and returned to Mukden. Messrs. Elias, Einig, Shaner, and Martin proceeded to Formosa and inspected the northern area. They rejoined Mr. Pauley at Manila, P. I., on June 23, with the exception of Mr. Martin who proceeded on to Tokyo. . . . . . . . . June 18, 1946

Mr. Martin T. Bennett, General Schulgen, and Messrs. Hurndall, Cleaveland, and Taylor, together with Chinese engineers, inspected the Chinchow, Chinhsi, Hulutao, and Fouhsin-Peipiao areas. . . . . . . . . . June 19, 1946

Mr. Pauley and a small group of the Mission left Mukden for Tokyo. A staff of technicians remained in Mukden to complete the Manchurian survey under the direction of John P. Hurndall. . . . . . . . . . . . . . June 20, 1946

At Tokyo, Mr. Pauley had further conferences with General MacArthur and Ambassador George Acheson. . . . June 21, 1946

Mr. Pauley and his staff at Tokyo met with appropriate members of General MacArthur's staff and discussed the Mission's surveys of Soviet occupied Korea and of Manchuria.

In Manchuria, Colonel Mayer proceeded from Mukden to Harbin and Changchun to arrange for entry of Mission into Chinese Communist territory. . . . June 21 - 22, 1946

From Tokyo, Mr. Pauley and his staff left for Europe via Manila, Calcutta, Karachi, and Cairo, and thence through Europe for conferences in connection with German reparations and allied problems. Complete log of this leg will be found in "Supplement to German Reparations Report, June to July, 1946", by Ambassador Pauley. This group returned to Washington, D. C., July 19, 1946. . . . . . . . . . . . . June 22 thru July 19, 1946

Under Mr. Hurndall's direction the Manchurian staff of the Mission proceeded to Changchun from Mukden and inspected that area. . . . . . . . . . . . June 24 - 27, 1946

Messrs. Hurndall, Cleaveland, Taylor, Thorne, and Swift, together with Colonel Mayer and Captain Scott, proceeded to Harbin and met with General Lin Piao, Commander of Chinese Communist forces in Manchuria, as well as Soviet Major General Zhuraleff, in charge of the Russian Staff of the Chinese-Changchun Railway. Mission inspected industry in Harbin. . . June 28, 1946

Mission party in charge of Mr. Cleaveland inspected the Mutanchiang area and railway. . . . . . June 29 - 30, 1946

Mission party returned to Harbin from Mutanchiang and continued inspection of Harbin area. . July 1 - 2, 1946

| | |
|---|---|
| Mission returned to Changchun and continued inspection of Changchun area. . . . . . . . . . . . . | July 3 - 4, 1946 |
| Mr. Hurndall inspected Kirin and Tafengmen areas and returned to Changchun. . . . . . . . . . | July 1 - 3, 1946 |
| Mission returned from Changchun to Mukden to work on report. . . . . . . . . . . . . . . . . . . . . | July 5, 1946 |
| Manchurian part of Mission under Mr. Hurndall proceeded to Peiping, China to await Soviet authority to enter Dairen. . . . . . . . . . . . . . . . . . . . . | July 10, 1946 |
| Mission left Peiping for Tokyo after failing to secure authority from the Soviets to enter Dairen. | July 15, 1946 |
| Mission conferred with appropriate members of General MacArthur's staff regarding Manchurian survey. . . . . . . . . . . . . . . . . . . . . . . . . . . . | July 16, 1946 |
| Mission proceeded from Tokyo to Washington, D. C. . . . . . . . . . . . . . . . . . . . . . . . . | July 17, 1946 |
| Manchurian part of Mission arrived in Washington, D. C. and rejoined Mr. Pauley and other members of the Mission who had arrived from Europe on July 19. . . . . . . . . . . . . . . . . . . . . . . . . . | July 20, 1946 |
| Mr. Pauley conferred with President Truman and gave him an advance report on the work of the Mission. | July 22, 1946 |
| The staff began work on the final report of the Mission. . . . . . . . . . . . . . . . . . . . . . . | July 22, 1946 |
| Mr. Pauley held a press conference at which he | |

and Mr. Martin T. Bennett outlined the extent of the
Mission's trip and its accomplishments. . . . . . . .    July 23, 1946

# CHAPTER I

## General Summary

### A. SCOPE

The objectives of the 1946 Pauley Mission in Manchuria were: to survey Japanese assets subject to reparations; to ascertain the present productive capacity of industry; to estimate what immediate reparations removals from Japan could be utilized to improve or rehabilitate that industry; and to prove or disprove reports that crippling removals had been made from that area.

The Mission was organized in Washington in April 1946 pursuant to instructions from the President. It contained well-known American engineers specializing in various fields of industry. On May 4, 1946, the Mission departed from Washington for the Far East. After a short stay in Tokyo where the Mission was augmented by a number of industrial specialists from General MacArthur's headquarters, the group departed for Seoul for a survey of Korea. A base was established in Mukden, Manchuria, on May 27, 1946 and from there inspection trips were made to the various important industrial and mining centers. Among these were Mukden, Fushun, Liaoyang, Anshan, Penchihu, Kungyuan, Chinchow, Chinhsi, Peipiao, Fouhsin, Hulutao, Kaiyuan, Ssupingchieh, Hsian, Changchun, Kirin, Harbin and Mutanchiang. Dairen, the finest seaport in Manchuria, and an important industrial center, was not reached because authority for the visit could not be secured from the Soviet Government or local authorities. Antung, another important point was not visited because Chinese Communists refused permission. The work of the Mission was greatly facilitated by the whole-hearted cooperation of the Chinese National Government and of all United States Agencies in the Far East. Chinese Communists were of assistance in the visits in territory held by them in Northern Manchuria. The Mission left China on 15 July 1946 and returned to Washington on 21 July 1946.

The principal sources of data upon which this report is based are the following:

a. In Washington: Conferences with and studies made by appropriate Sections of the State, War, Navy and Commerce Departments, Office of Strategic Services, Foreign Economic Administration and other governmental agencies.

b. In Tokyo: Conferences with and studies made by agencies of Supreme Allied Commander. Interviews with Japanese responsible for the management of Manchurian industry and study of Japanese records.

c. In Manchuria: Inspection of industrial plants in the centers mentioned. On-the-spot interviews with persons who were present before, during and after the Soviet occupation were most fruitful. These included Chinese, Japanese, American and European Nationals. At the time of the survey many Japanese industrial executives had not yet been repatriated, so that many documents such as diaries and production records were available in Manchuria.

It is recognized that in the interviews with individuals, the Mission was dealing with hearsay evidence and that some of the information received was biased and exaggerated. Nevertheless, by comparing data from the different sources and balancing it against observed conditions, it is believed that an accurate picture was evolved and that this report is substantially accurate.

## B. BACKGROUND

United States policy in the postwar Far East was predicated upon the establishment of China as a strong, stable, united nation, with a basic economic self-sufficiency, so that nation could take its proper part in the development of a peaceful Asiatic economy. During the years before and after Pearl Harbor the Japanese had created in Manchuria a tremendous industrial structure which was definitely tributary to the economy of Japan. Had this structure remained as intact as it was on the date of Soviet occupancy and had China remained peaceful, the Manchurian industrial complex could have readily been integrated with China's growing economy and so greatly accelerated the overall Chinese industrial development. The large capacities in basic industries in Manchuria would have made possible a rapid absorption by China of further processing equipment removed from Japan as reparations. At the same time this action would have lopped off from Japan one of the most important sources of strength in the Japanese war potential. It was presumed that China could fill at least partially, the economic vacuum resulting from the Japanese defeat and the consequent imposed reduction of Japan's productive capacity to a peacetime level. However, the damage which Manchurian industry has sustained since V-J Day has set back China's industrial progress for a generation and has thus materially delayed the implementation of announced U.S. policy.

Japan's interest in the Asiatic Mainland has been of long standing. The clash of Russian and Japanese interests there, resulted in the Russo-Japanese War in 1904, and the acquisition by Japan of Russian concessions in South Manchuria. With the establishment of the South Manchurian Railway in 1906, Japan's exploitation of Manchuria took definite form. The railroad expanded into many industrial enterprises which furnished a wedge for further Japanese penetration on the continent. With the seizure of Manchuria from China by the Kwantung Army in 1931 and the creation of the Puppet State of Manchukuo, the exploitation was tremendously accelerated.

Impelling motives in Japan's development of Manchuria stemmed primarily from two sources. One, the ultra patriots including the military clique, the Black Dragon Society, and all dreamers of a Pan-Asiatic hegemony under Japanese domination, found in the conquest and exploitation of Manchuria an essential step in the march to empire. The Japanese Kwantung Army played no small part in advancing the aims of the military clique. The other source, the Zaibatsu (ruling commercial combines) saw in Manchuria an opportunity for an enormous source of profit. The Japanese Government and the puppet Manchukuo Government assisted the Zaibatsu in their exploitation with preferential treatment and subsidies. There was no altruism in these actions. Japan took care that management and technical skills remained in Japanese hands, using the local population primarily as a source of cheap labor.

Manchuria is a relatively rich country. It abounds in many natural resources which exist much more sparsely in the remainder of Asia. It is one of the few areas of great size which has consistently produced agricultural surpluses. Manchuria was fortunate in that the Japanese in their industrial development there provided a far greater capacity in finished products than in any other conquered country. It was Japan's apparent intention to make Manchuria industrially an integral part of the Japanese Empire and a source of economic strength for further military conquest. This is indicated by the fact that a great deal of construction and development of industrial and power facilities were still going on at the end of the war. From 1932 to 1944 coal production was more than doubled and the output of pig iron and iron ore was more than tripled.

The best estimate of the total of Japanese investments in Manchuria as of June 1945, is ¥11,000,000,000. In arriving at this estimate, figures cited by the Chinese Northeast Economic Commission, the British Ministry of Economic Warfare, the U.S. Foreign Economic Administration, and Japanese sources were also consulted. The Chinese compilation is appended to this report as Source File 201-X-10 in Appendix 1.

The defeat of Japan caused the disruption of the production centers and trade channels built up by Japan in its empire-building and conquests, thus upsetting the entire economic structure of the Far East. U.S. policy is now directed toward the establishment of an economy that will promote a lasting peace in the Far East and to prevent the resurgence of Japanese economic domination.

U. S. policy has long held that all Japanese assets whether situated in Japan proper or in other areas, were subject to claim as allied reparations. Japanese assets in conquered areas such as the Philippines, China, including Manchuria, and Korea, were to be taken from Japanese ownership and control and were to be operated for the benefit of the countries where the physical assets exist. Under what conditions full and complete title to these assets is to be vested in the local governments and under what conditions the ex-Japanese industrial plants are to be considered as part of the overall reparation allocation, is still under discussion and awaiting allied agreement. It was considered that this primary step was necessary in order to strengthen the economies of the countries which had been victims of Japanese aggression and further to keep the facilities operating in order to prevent loss of needed production and safeguard the livelihood of the local population.

The next step needed is the realignment of production areas and trade channels in the Far East so as to secure a properly balanced regional economy that can be both productive and profitable; an economy that does not have to rely upon subsidies, confiscation, and oppression to maintain itself. The United States reparations plan is aimed at achieving these two important steps: to turn over to local non-enemy governments control of the Japanese assets situated in those countries; and, to transfer surplus capacity from Japan to regions where it can best be used to process the natural resources so as to satisfy the needs of the Far East. In the steel industry for example, where Japan has a much larger capacity than is needed for her normal peace requirements, the U.S. policy would remove this surplus capacity and place it near sources of iron ore and coking coal. Such areas can be found in Manchuria, China proper, and the Philippines.

## C. FINDINGS

The difference in condition of the Manchurian industrial plant between Japanese surrender and the dates the Pauley Mission made its survey is appalling, as will be shown in the remainder of this report. How much of the wrecked condition is a direct result of Soviet removals, and how much may be ascribed to pillage, civil war, and other indirect consequences of the Soviet occupation cannot be accurately determined. In any case, the Soviet government must bear the major responsibility.

Soviet forces entered Manchuria on 9 August 1945. Japanese resistance was confined to Northern Manchuria and within a week this ended. Southern Manchuria, which contained over eighty percent of Manchurian industry, was taken practically unopposed and with little if any damage. There was ample opportunity for the orderly occupation of the entire area.

Japan was preparing to surrender prior to the Soviet entry into the Japanese war. The rolling up of the Southwest Pacific front, the rapid penetration of the Pacific defenses, and the powerful blows struck against the Japanese homeland forced Japan to seek means for halting the conflict. A partial chronology of important events from June 15, 1944 taken from General MacArthur's reports and other official sources shows the following:

| | | |
|---|---|---|
| Landings on Saipan | June | 15, 1944 |
| Landings on Guam | July | 21, |
| Landings on Leyte | October | 20, |
| First B-29 raids on Japan from Saipan | November | 24, |
| Landings on Luzon | January | 9, 1945 |
| U.S. Navy 3rd Fleet struck Tokyo and Nagoya-Kobe areas | February | 16-17, |
| Landings on Okinawa | April | 1, |
| Abrogation by Soviets of Treaty of Neutrality with Japan | April | 5, |
| Naval operations against Japanese homeland from North Hokkaido to Tokyo | July | 14-17, |
| Potsdam Ultimatum issued to the Japanese Government | July | 27, |
| First atomic bomb dropped on Hiroshima | August | 6, |
| Soviets declare war on Japan and invade Manchuria | August | 9, |
| World receives news of Japan's acceptance of Potsdam Ultimatum | August | 10, |
| General MacArthur acknowledges receipt of news of Japanese acceptance | August | 11, |
| Sino-Soviet Treaty signed at Moscow | August | 14, |
| President Truman announces unconditional surrender of Japan | August | 15, |
| Japanese Commander in Manchuria appeals by radio to Soviets to cease attacks | August | 16, |

| | | |
|---|---|---|
| Unopposed Soviet air landing at Mukden | August | 18, 1945 |
| Japanese delegation arrives in Manila to receive orders | August | 19, |
| Unopposed Soviet air landings at Kirin and Changchun | August | 20, |
| Eighth Army advance party landed at Atsugi Airdrome, Tokyo | August | 28, |
| General MacArthur arrives at Atsugi | August | 30, |
| Formal signing of surrender terms in Tokyo Bay | September | 2, |

Upon their arrival in the industrial areas of Manchuria, the Soviets began a systematic confiscation of food and other stockpiles and in early September started the selective removal of industrial machinery. It is apparent that they planned to complete these removals by 3 December 1945, the date originally set for the withdrawal of all Soviet military forces from Manchuria.

The term "stripping" as it has been used in the press in connection with removals from Manchuria may be confusing. The Soviets did not take everything. They concentrated on certain categories of supplies, machinery and equipment. In addition to taking stockpiles and certain complete industrial installations, the Soviets took by far the larger part of all functioning power generating and transforming equipment, electric motors, experimental plants, laboratories, and hospitals. In machine tools, they took only the newest and best, leaving antiquated tools behind. In the old Mukden Arsenal, for example, about one-third of the tools were taken, while in the new arsenal, virtually everything was taken or demolished.

Not only were buildings and structures damaged by the removal of the equipment, but the taking of some key equipment, such as generators and pumps from mines resulted in the loss of current production, and in irreparable damage to the mines by flooding. The removal of power facilities not only halted all current industrial production, but also made it impossible to maintain and protect the plants themselves. Water works and sewage facilities in the large cities were made inoperable because of lack of power.

After the removals, the Soviet forces permitted and even encouraged Chinese mobs to pillage, taking official movies of the process in some instances. Apparently the mobs were in search of objects of salable value and of wood for fuel to burn during the bitter Manchurian winter. The fuel problem was, of course, enormously intensified by the stoppage of a large part of coal production because of Soviet removals.

By far the greatest part of the damage to the Manchurian industrial complex occurred during the Soviet occupation and was primarily due to Soviet removals of equipment, and to Soviet failure to preserve order. After the Soviet withdrawal, Chinese Communist action resulted in further damage to some of the installations. It is a sad commentary that the small amount of benefit received by the Soviet Government in its removals from Manchuria could have been readily supplied by reparations removals from Japan proper at a much smaller cost to the world.

The Soviet forces also confiscated approximately three million

U.S. dollars worth of gold bullion stocks and over a half billion Manchurian yuan from Manchukuo banks. They also circulated nearly ten billion yuan in occupational currency, almost doubling the total Manchurian note issue. In addition to the removals, mentioned above, occupational currency was used to purchase factories and properties and some privately-owned merchandise and materials.

It is difficult to ascertain in Manchuria the real reasons behind the Soviet actions there. The excuse that the articles removed were in the nature of "war booty" and were desperately needed to replace damage caused by the German invasion at home, does not fully cover the situation. As for reparations, the Soviet military effort in Manchuria which lasted only a few days is minute when compared with the long, tremendous and costly operations in the Pacific. Therefore, the Soviet Government would not be entitled to substantial reparations from Japanese-owned assets merely on the basis of their operations in this area. Obviously Japanese assets in Manchuria did not belong solely to the Soviet Government. Other nations too are logical claimants. In the allied reparations discussions at Moscow, Potsdam and Paris in 1945, the allies expressed as a principle that the greatest economic utility would result if the industrial equipment in Manchuria were left intact there, in the locations for which these items were specifically designed. Moving this equipment has destroyed a large part of its original value and the installations from which this equipment was removed have in many cases become total losses.

It can also be pointed out that there are now in the occupied zones of Germany (other than the Soviet occupied zone) reparations items which under the terms of the Potsdam Agreement were destined to be delivered to the Soviets. The nations occupying these zones are also entitled to Japanese reparations and so have a legitimate claim on the Japanese assets removed from Manchuria by the Soviet Government. Thus Soviet claims on German reparations in occupied zones could be counterbalanced by claims by other nations on the Manchurian removals. However this would require revision of the entire global reparations program.

Soviet actions in Manchuria are high-lighted by the entirely different policy followed in Korea where there were practically no capital removals or destruction of industry. In Manchuria the confiscation and removal of food stocks, the destruction attendant upon and following the removals of machinery, the almost complete halting of productive effort with no regard for the harmful effects upon the Chinese population, all indicate that there were long range strategic reasons behind the Soviet actions. The chaos caused by the Soviets has produced a condition of instability both politically and economically which will take a long time to correct. If left a populace hungry, cold, and full of unrest.

It is generally agreed that China's first economic need is communications, principally railways, transport, and domestic shipping. Less than 10,000 miles of railway is in existence in all of China exclusive of Manchuria and less than half of that is now operable. Manchuria with its abundant natural resources and industrial plant would have been the logical point to begin the rehabilitation of China's transport. If Manchurian industry had been left intact it could also have produced the steel, machinery and consumer goods so badly needed for restoration and for new construction in China.

China's continuing internal strife is a major factor in retarding her economic recovery. But even this cannot minimize the powerful set-back which the destruction of the Manchurian industrial plant has been to Manchuria, to China, and to the Far Eastern World.

## D. CONCLUSIONS

The situation in Manchuria today is far from promising. The internal struggle continues intermittently. Dairen, by far the best port, has been practically sealed off by the Soviets for their own exclusive use, despite the fact that under the terms of the Sino--Soviet Treaty of August 14, 1945, Dairen is to be an open port and the Soviets are entitled to use only part of the port facilities. Railway communications to the few remaining secondary ports are under constant harassment by Chinese Communists. Thus, even if Manchurian industry were working full blast, it would be most difficult if not impossible to move any large quantity of finished products to China proper. It would be just as difficult to move into Manchuria the equipment necessary to rehabilitate industry.

Little can be done in the way of rehabilitation in China in the areas where fighting is going on or where the threat of armed action is present. This, however, should not delay the preparation of plans so that when peaceful conditions are resumed and communications restored, a rapid and orderly process of rehabilitation of the plants essential to primary needs of the inhabitants can begin. The natural resources are there. In restoring Manchuria's industrial complex, however, it must be remembered that Manchuria is practically surrounded by territory either wholly or partially under direct Soviet control.

Manchuria will thus be vulnerable to further Soviet penetration.

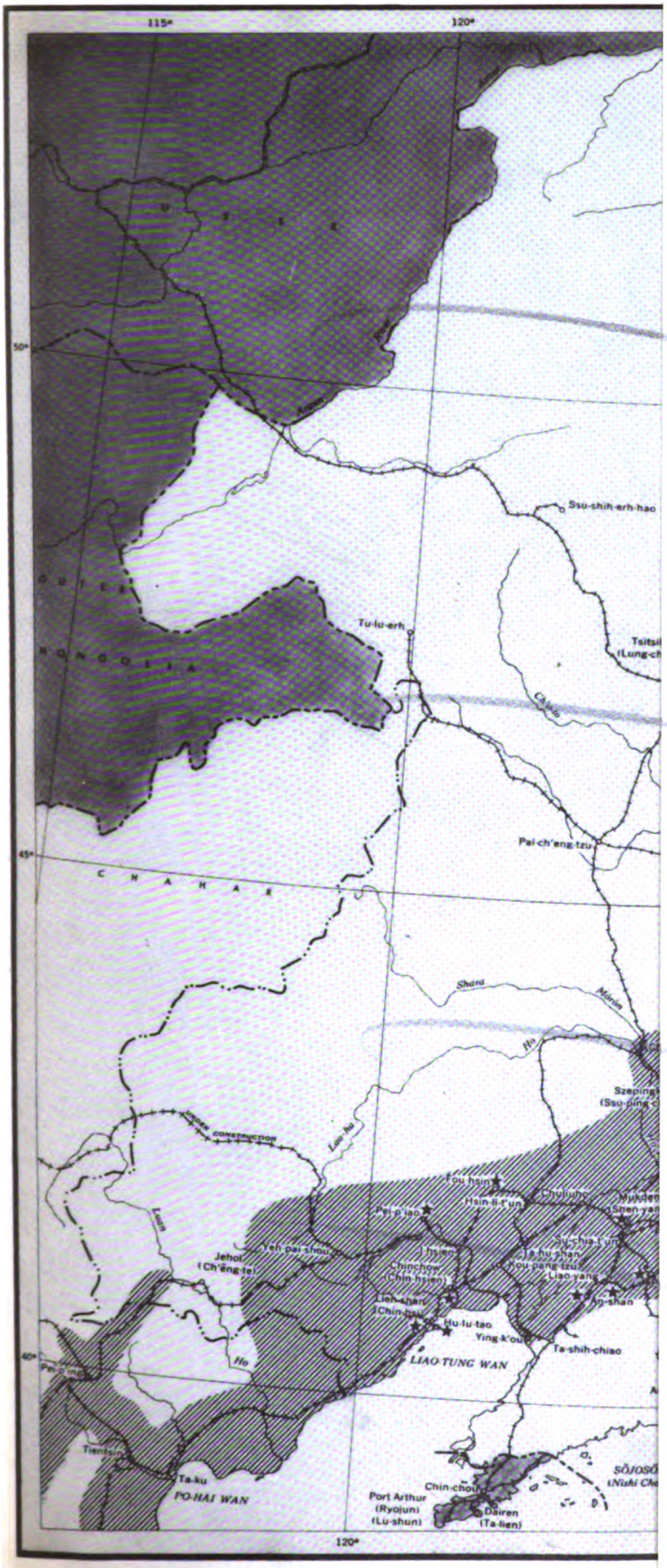
In the meantime no effort should be spared in the industrial strengthening of the peaceful areas of other parts of China. China's urgent needs are manifold, but the prime need is for steel, for railroads, shipping, construction and consumer goods. One important steel producing area lies on the Yangtze River, near Hankow. There are others. These must be surveyed with a view to the immediate transfer to those areas as reparations from Japan, of such equipment as can be efficiently utilized. Similar recommendations have been made with respect to the Philippine Islands. The Chinese Government was urged to take action along these lines during Ambassador Pauley's conferences in Nanking on 25 May 1946. The necessity for immediate transfer of critically needed power equipment for the coal mining areas of Manchuria from Japan was also pointed out in a letter from Mr. Pauley to General MacArthur dated 20 June 1946. Training of additional Chinese personnel in engineering and management of the industrial equipment is also essential.

Manchuria's power installations are first priority in rehabilitation. This includes hydro-electric stations as well as thermal power plants at the coal mines. If sufficient power generating equipment can be quickly transferred from Japan, there is a good chance of salvaging one or two important coal mines that are now flooded or in grave danger of flooding.

Another possible and readily available but limited source of power is what remains of the hydro-electric development now in operation at Tafengmen near Kirin and which is furnishing power to Harbin and Changchun. Transmission lines to the South have been cut by Chinese

Communists who will not permit repair. Until peace between the Communists and Chinese Nationalists is restored, this badly needed power is being wasted. Restoration of electric power in Manchuria will go far toward alleviating the immediate needs of the populace.

Given the best of conditions, China's rehabilitation is a matter of many years. In the meantime the stability of the entire Far East is in a large measure dependent upon satisfying the urgent needs of the populations of the various countries lying there. They all need materials and machines for reconstruction. Failure to supply these needs will result in continued unrest and instability.


115°
120°
U. S. S. R.
Amur
Argun River
50°
Ssu-shih-erh-hao
OUTER MONGOLIA
Tu-lu-erh
Tsitsi
(Lung-ch
Ch'ao
Pai-ch'eng-tzu
45°
CHAHAR
Shara
Muren
Ho
Szeping
(Ssu-ping-c
UNDER CONSTRUCTION
Lao-ha
Fou-hsin
Hsin-li-t'un
Pei-p'iao
Chuliuho
Mukden
Shen-yan
Su-chia-t'un
Liao
Yeh-pai-shou
Jehol
(Ch'eng-te)
Hsien
Ta-hu-shan
Kou-pang-tzu
Chinchow
(Chin-hsien)
Liao-yang
An-shan
Lien-shan
(Chin-hsi)
Hu-lu-tao
Ying-k'ou
Ta-shih-chiao
40°
Pei-p'ing
Ho
LIAO-TUNG WAN
Tientsin
Ta-ku
PO-HAI WAN
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
SŌJOSŌ
(Nishi Ch
120°

# CHAPTER II

## Development and Destruction of Manchuria's Economy

### A. BACKGROUND

Soviet interest in Manchuria is an heritage from Czarist days. Toward the end of the 19th Century, China, unable to withstand the encroachments of Japan and the Western powers, granted Russia a concession to construct the Chinese-Eastern Railway and the southern link from Harbin to Port Arthur. With the railway agreements were included special area rights as well as a lease of the Liaotung (or Kwantung) peninsula containing Dairen and Port Arthur. The Liaotung peninsula had been ceded to Japan by China as a result of the Sino-Japanese war of 1894 but in 1895 European powers led by Russia, forced Japan to return this area to China. Further conflict of interests between Russia and Japan in the Far East led to the Russo-Japanese War in 1904. The Treaty of Portsmouth in 1905 ending this war gave to Japan the Russian rights in the Kwantung peninsula and that part of the railway running from Changchun south to Port Arthur.

Japan formed the South Manchurian Railway in 1906 to take over her newly won railroad rights and thus began the modern Japanese exploitation of Manchuria. It is interesting to note that despite the 1904 war, Japan and Russia completed between 1907 and 1916 no less than seven treaties defining and protecting their interests in Manchuria. Four of these treaties were secret. During this period Russian economic penetration of Manchuria continued under the aegis of the Chinese Eastern Railway. The Russian Revolution in 1917, followed by Soviet renunciation of extra-territorial rights in China in 1920, weakened the Soviet hold. With the seizure of Manchuria by the Japanese Kwantung Army in 1931 and the creation of the puppet state of Manchukuo, the rate of Japanese exploitation was tremendously accelerated. In 1935, after considerable negotiation, the Soviet Government sold the Russian rights in the Chinese Eastern Railway to the Japanese Government. By restrictive legislation and other acts Japan managed to freeze out most of the foreign interests in Manchuria, leaving herself in complete control.

Japan is deficient in natural resources. In order to maintain her hold upon the areas she conquered and penetrated, Japan created an artificial empire economy. Her control over governmental and fiscal policies was absolute. By keeping most of the industrial finishing processes in Japan proper and drawing upon the conquered areas only for raw materials and semi-finished products, she made the outside areas dependent upon Japan for economic outlets. This method necessitated large government subsidies, in order to encourage development within Japan of those processes which normally would have grown up around the natural resources.

Manchuria is rich in coal and other minerals. It has great hydro-electric power potentialities. It has large timber reserves. It is one of the few large areas in the world which have consistently produced an exportable surplus of food stuffs. The Soya bean and its derivatives have long been valuable products in world trade.

Japanese exploitation first took the form of making Manchurian industry tributary to Japan proper. This was the pattern Japan followed in most of her penetrations into and conquests of the countries comprising the "Co-Prosperity Sphere". Basic industries, particularly, mining, transportation, and power received first attention. In the last few years it is apparent, however, that the Japanese were considering Manchuria as an integral part of the Japanese empire and were to a much larger extent than in other conquered areas, developing Manchuria as a more self-sufficient area.

In the field of electric power, the Japanese began by acquiring the existing thermal plants, increasing their capacities and standardising their operation. New plants were built where required. A long range hydro-electric survey was made and in 1938 construction began on the plants and transmission networks. At Tafengmen near Kirin a 563,000 KW hydro plant was under construction with 283,000 KW in operation in 1945. A joint project with Korea for the development of power from the Yalu River, which forms the border between the two countries, was producing 600,000 KW of a planned 700,000 KW. By 1945 distribution of hydro-electric power was fast relegating many thermal plants to the position of standby producers. From a capacity of about 250,000 KW in 1932, by August 1945 Manchuria had reached a total theoretical capacity of 1,790,000 KW in thermal and hydro plants.

In coal, an annual production of about 10 million metric tons in 1929 was increased to over 25 million metric tons in 1944. Additional mines, fresh capital, new methods and machinery were responsible for this increase. Most of this coal production was used in Manchuria, for industry, for the railways and for domestic heating. In the last three years of the war (1942-44) over four million tons annually were used for domestic heating, an indication of the increase in living standards.

Iron and steel production made remarkable strides. The mines supplying iron ore to Anshan, Penchihu and Tungpientao had by 1944 a theoretical annual capacity of over eight and one-half million metric tons. At least half of the ore has a lower iron content than U.S. practice considers profitable and requires concentrating before being charged into a blast furnace.

Production of pig iron reached a high of 1.7 million tons in 1943 of which nearly half was used in Manchuria and the balance exported to Japan for processing. In crude steel production, an annual capacity of 860,400 tons was reached.

Similar developments increased production in the non-ferrous mining and metal industries, in liquid fuels and lubricants, in chemicals, in cement, textiles, paper and pulp, lumber, railroads, and communications. Details for each industry will be found in succeeding chapters of this report.

Agriculture is one of the most important means of livelihood in Manchuria and the peasant was not neglected. Agricultural experimental stations were established, crop yields increased, and new crops planted. This was not for any altruistic purpose. The Japanese were in complete control of distribution and marketing and dictated the prices paid to the farmers for their products.

After Pearl Harbor the Japanese continued to press the industrial development of Manchuria. Industry as a whole suffered comparatively little as a result of our air action in Manchuria and the damage caused by our B-29 raids on Anshan, Mukden and Dairen had by 7 August 1945 been repaired or otherwise largely discounted.

Large construction of housing and the building of cities and towns accompanied the industrial development. In the cities and around industry, public utilities and public health installations, including hospitals, kept pace according to Japanese standards with the general trend.

All this development was under complete Japanese direction and was designed to aid further Japanese conquests. The Japanese took care that management and technical skills remained in their own hands. The Chinese populations were exploited and used as a source of cheap labor. Nevertheless, in general the local people had employment, housing, and health care. Up to August 1945 Manchuria had suffered little by the ravages of war.

## B. SOVIET OCCUPATION

A study of Japanese and Soviet communiques, press items, intercepted broadcasts and other documents during the period, shows that on 9 August 1945, the Soviet forces entered Manchuria in seven columns, four from Siberia and three from outer Mongolia. Japanese resistance was sporadic and crumbled early. The Japanese Government on 10 August

1945, offered to accept the terms of the Potsdam Declaration with some qualifications. On 14 August the Japanese accepted the surrender terms unconditionally. A Sino-Soviet treaty was signed on 14 August at Moscow and will be discussed further in this report. On 16 August 1945 the Japanese Kwantung Army broadcast by radio to the Soviet Command a message that all front line Japanese troops had ceased movement and appealed for a cessation of Soviet attacks. This message was repeated every hour. The Soviets continued their advance and on 18 August an unopposed air landing was made at Mukden. Further unopposed air landings were made at Kirin and Changchun on 20 August and at Dairen 21 August.

Up to 20 August 1945 the Soviet ground forces had barely reached the fringe of Manchurian industrial complex, over 80 percent of which lies south of an EW line through Changchun. The southern area was taken over with practically no opposition. There was ample opportunity for the orderly occupation of the entire area. There were some reports of rioting and looting by Chinese mobs during the period between the announcement of the Japanese surrender and the arrival of Soviet troops. But in general the Soviets took over an orderly industrialized country capable of supplying itself and China proper with much needed materials. Transportation was in good condition and the warehouses were well-stocked with food and supplies.

## C. SOVIET REMOVALS

Since all of Manchuria's major industrial plants are former Japanese assets, as such they are subject to Allied reparations claims. The Occupation Directive to the Supreme Allied Commander states the following:

> "7. Japanese property located abroad. Existing Japanese external assets and existing Japanese assets located in territories detached from Japan under the terms of Surrender, including assets owned in whole or part by the Imperial Household and Government, shall be revealed to the occupying authorities and held for disposition according to the decision of the Allied authorities."

The effect of the Soviet occupation on Manchurian economy and productivity has been so great that a knowledge of what went on during that time is considered essential in reporting on the findings of this Mission.

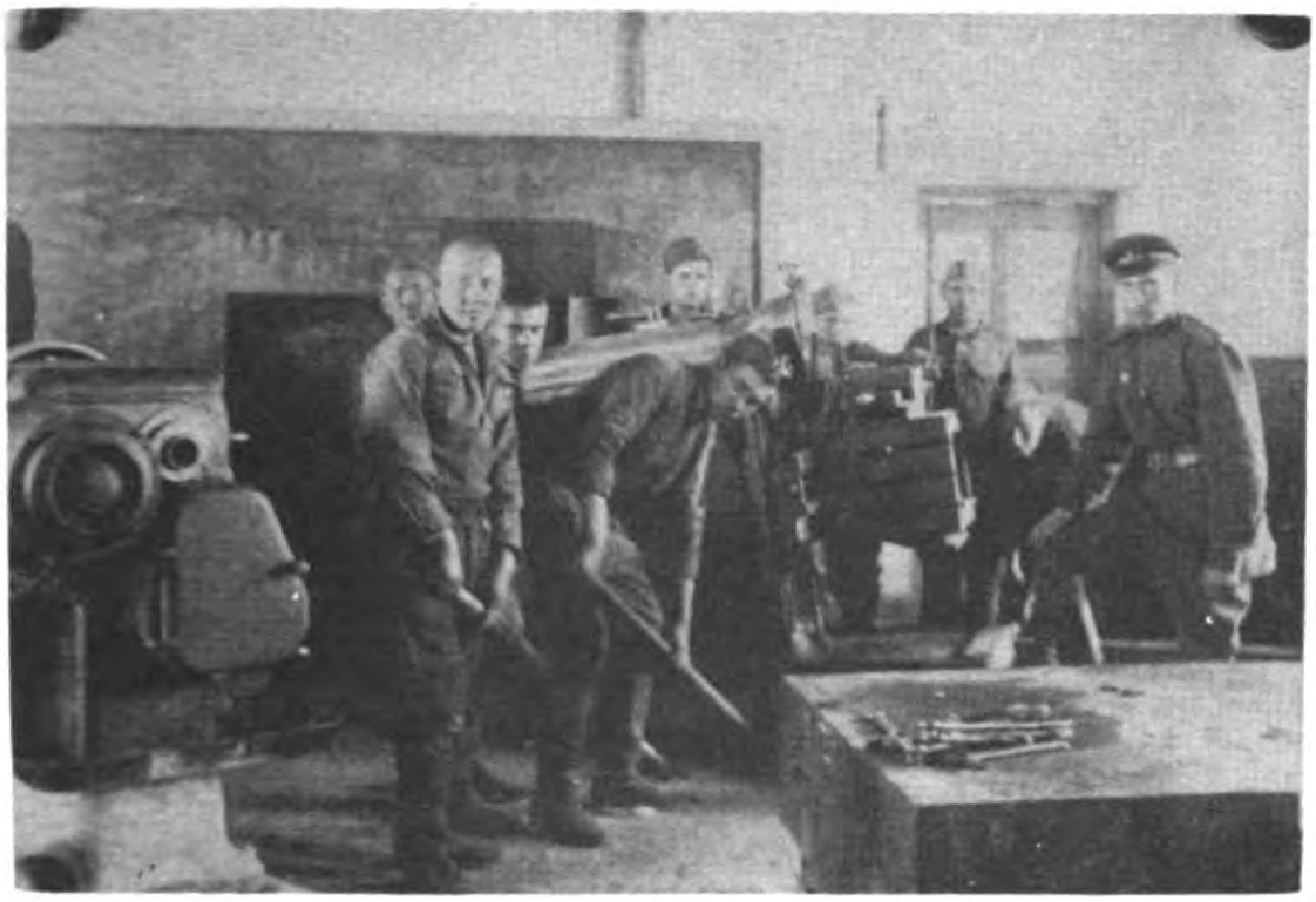
Our information on these events comes from systematic inquiries made among individuals who were present before, during, and after the Soviet occupation. These included Chinese, Japanese, European and American nationals and Soviet citizens. Among the Americans were United States Army and Marine personnel who had arrived prior to the Soviet entry to rescue Allied prisoners of war and internees. At the time of the survey many Japanese industrial executives had not yet been repatriated so that many documents such as diaries and production records were available to the Mission in Manchuria. Translations from several of these diaries are included in this report in Appendix 2. Where the sources of information were Japanese Nationals still in Manchuria, their names have been purposely omitted from the report in order to protect them from possible retaliation.

Some of the individuals who were interviewed were undoubtedly biased and their information exaggerated. Also, some of the evidence was hearsay. The Mission compared the information gained by interviews with factual data from other sources and balanced both against observed conditions, thus getting a complete and true picture.

The Soviets soon consolidated their hold on Manchuria and shortly after 1 September 1945 began a systematic and selective removal of industrial machinery. Principal attention was centered on power-generating and transforming equipment, electric motors, experimental plants, laboratories and hospitals. They also removed complete installations in the fields of heavy industry, mining, chemicals and cement. As the Soviets made a progressive take-over from the Japanese, production stopped and there was an immediate breakdown of law and order.

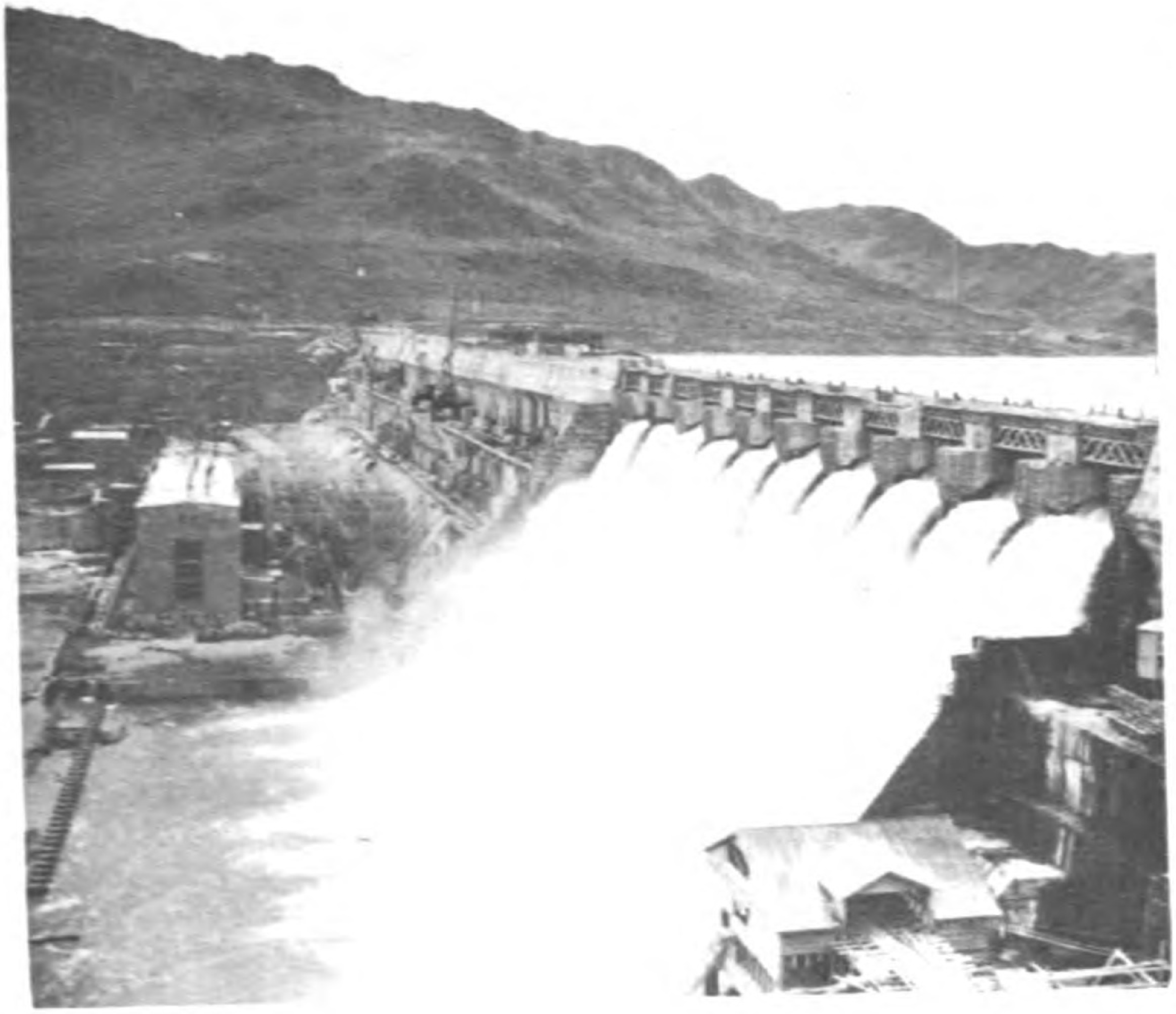
The first Soviet troops to arrive in Harbin, Changchun, Ssupingchieh, Kaiyuan, Fushun and Mukden were a particularly undisciplined lot. Street robbery, rape and murder were widespread. These "shock" troops were replaced after the first two weeks by better disciplined soldiers. Nevertheless looting and attendant disorders continued at a reduced scale. Little distinction was made between the treatment accorded Chinese and Japanese. With few exceptions these conditions prevailed in all areas taken over.

The methods employed by the Soviets in their removals was essentially the same in all areas. The Soviets were apparently following a plan which called for the removals to start in early September and to be completed by 3 December 1945, the date first set for the withdrawal of Soviet forces from Manchuria. In many instances specially trained Soviet engineering officers were in charge while in others the local military commander directed the removals. In each locality the Japanese head of the industrial installation was called by the Soviet Command and directed to furnish detailed plans of the plant.



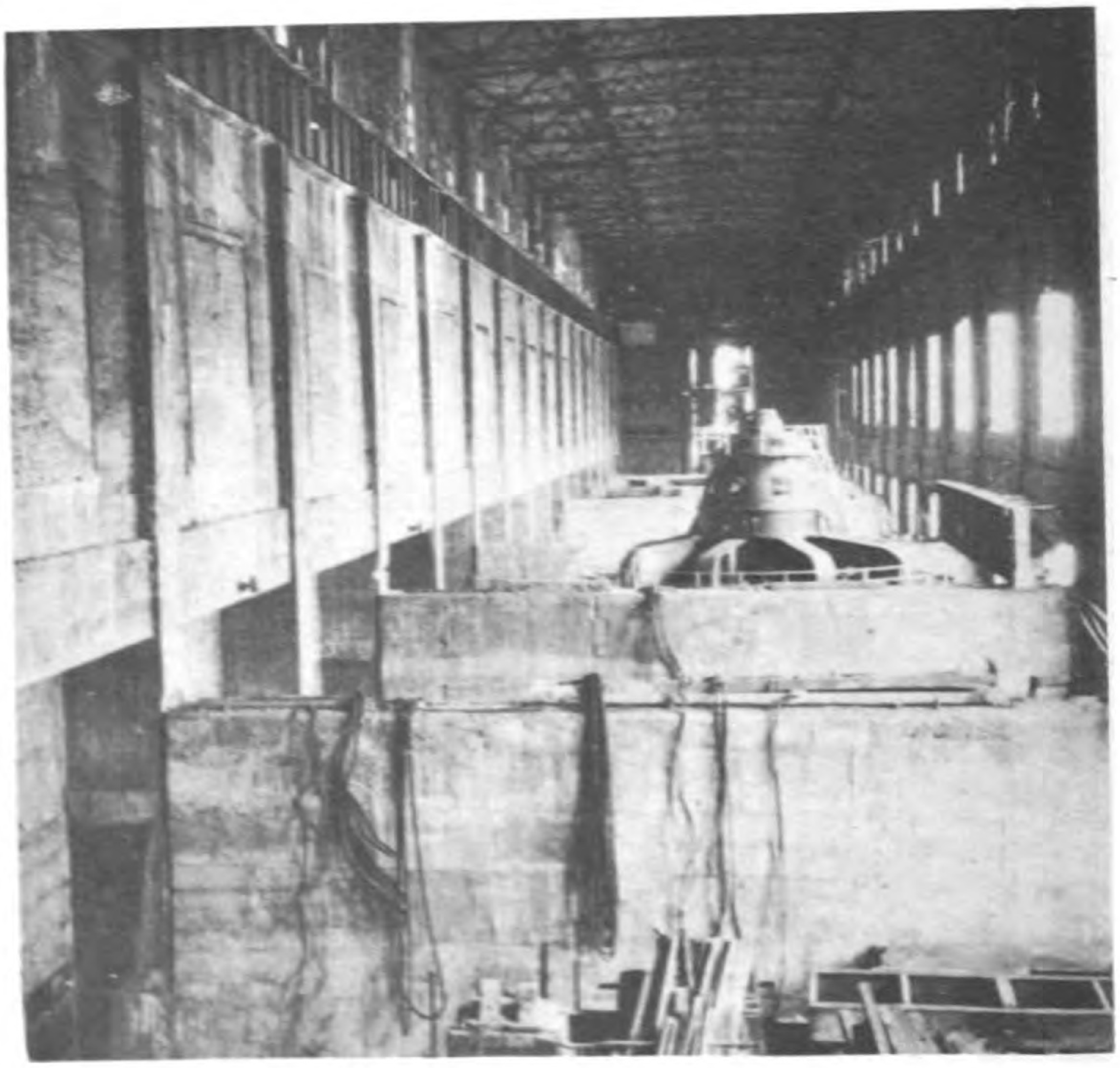
Manchuria

Soviet soldiers in process of removing industrial equipment from Manchuria factories. Pictures copied from a set furnished by Chinese authorities in Manchuria.



Tafengmen Dam and Hydroelectric generating plant. Designed to produce 563,000 kw, showing uncompleted part of dam. At the surrender of Japan work was still in progress on the dam to bring its height up to the level of construction at the very right of the picture and strengthening where the cranes are shown.

Tafengmen Hydroelectric generating plant showing bays from which turbo-generators were removed and showing one of the two remaining generators.



The equipment to be removed was then designated and the Japanese were ordered to dismantle and load the equipment within a given time. Chinese and Japanese labor, including prisoners of war were used under overall Soviet direction. In some instances Soviet troops were used in effecting the removals as shown in photographs herewith. In most cases the labor was paid (in occupation notes); in others only food was furnished. Only enough power installations were left intact to provide for the necessary mechanical handling of the equipment to be removed. After the removals the Soviet forces permitted and even encouraged Chinese mobs to pillage. In the process thousands of buildings and homes were destroyed. Motion pictures of the pillaging mobs in action were taken by the Soviets.

At Tafengmen dam near Kirin where the Japanese had an extensive and partly finished hydro-electric project, the Soviets left only such construction and power equipment as could be used to facilitate their removals. Six of the eight power generating units originally installed by the Japanese were taken. The Soviets removed the cement plant completely, leaving the cranes in place. The removals on this site were accomplished within the space of three weeks which shows fast and effective work.

The Tafengmen hydro-electric installation constitutes the only sizable one now operating in Manchuria since the large hydro-electric complex on the Yalu River is practically entirely in the hands of the Soviet forces occupying Northern Korea. Another interesting sidelight is that Tafengmen which is in Central Government Control, is by local agreement, furnishing power to Harbin which is in Chinese Communist hands as well as to Changchun which is in Nationalist territory. This same plant could furnish power to the Mukden area but the Communists have cut the transmission line and will not permit its repair.

On the Yalu River, demarking part of the border between Korea and Manchuria, the Japanese built at Suiho (Supong) an extensive hydroelectric installation to serve both countries. The generating plant is located on the Korean side of the river. While Soviet authorities would not allow the Mission to visit the Suiho plant, telephonic reports of the progress of the removals and eye-witness reports of movement of the equipment were consistently verified by the Seoul operators of the Korea Hydro-electric Company system who were controlling the flow of power in Korea at the time. A 50 cycle generating system was used to serve Manchuria and a 60 cycle system to service Korea. The Soviets removed practically all the 50 cycle equipment. (The USSR power systems are standardized at 50 cycle). At present the only Manchurian area receiving power from the Yalu River is the Soviet-held Kwantung Peninsula containing Dairen and Port Arthur.

In the matter of hospitals, libraries, laboratories, schools, and universities, the Soviets exhibited little concern for either the immediate or future welfare of the Chinese people. At the close of the war the Japanese had eighteen hospitals in Manchuria. The industrial hospitals at Fouhsin, Anshan, Penchihu, and Yentai were completely stripped and the patients moved out. At other places most of the vital equipment such as surgical instruments, machines, laboratory equipment and drugs were taken. Considerable quantities of such material was observed for sale in local Chinese "flea markets". As a result of Soviet removals of key medical equipment and the subsequent looting by Chinese mobs it is doubtful if one completely equipped hospital was left in Manchuria when the occupation ended. Libraries, schools and universities were likewise systematically stripped of equipment and then wrecked by local Chinese in the search for loot and fuel. The Northeast University at Mukden is a complete loss with nothing left of the buildings except the bare walls. Good educational installations at Harbin and Changchun met a similar fate.

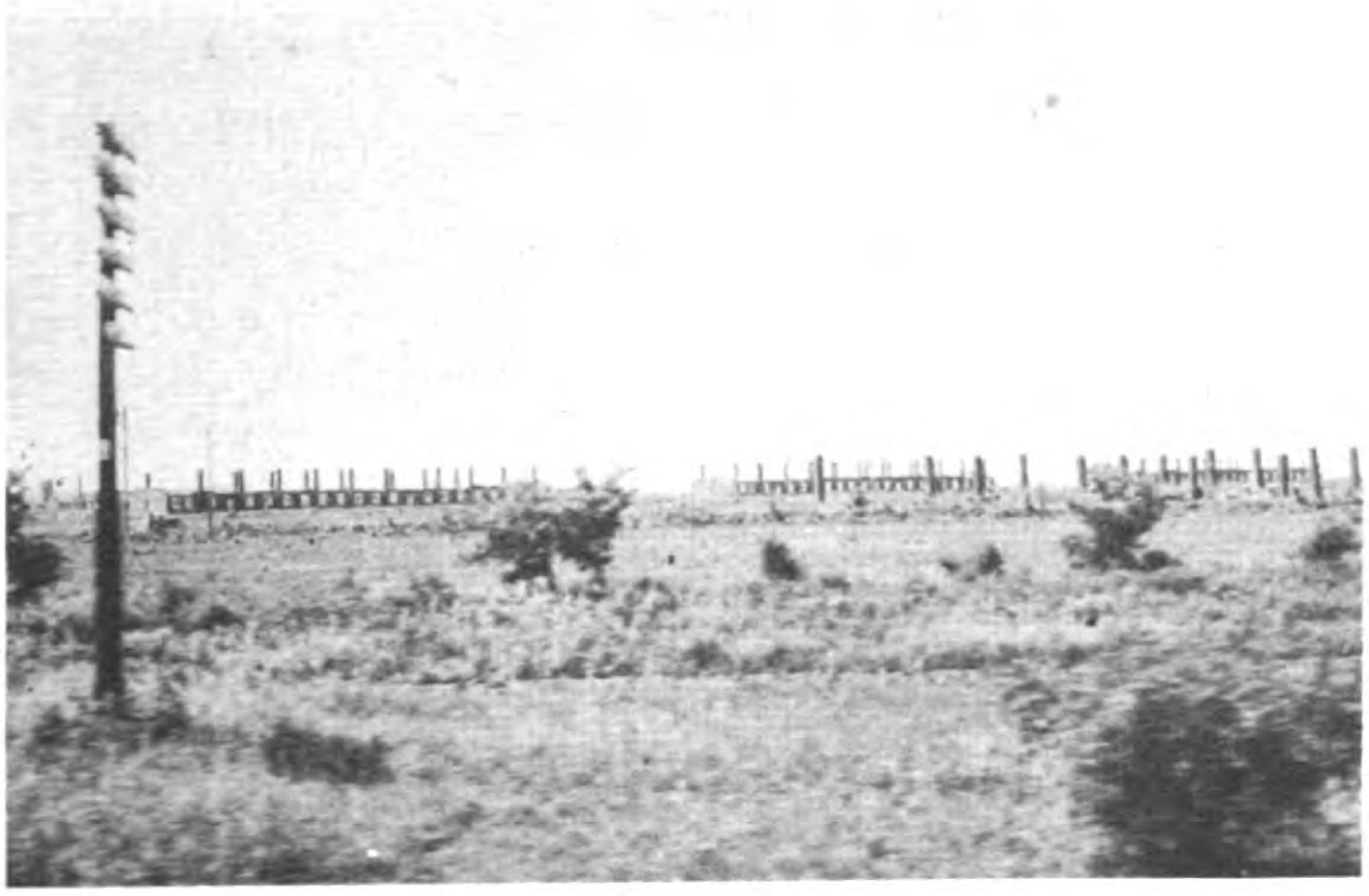
The Red army practice of living off the country was followed in Manchuria. In the larger industrial cities such as Anshan and Fouhsin the food warehouses belonged to the industrial company around which the activity of the city centered. On the arrival of the Soviets these warehouses which were well-stocked were immediately commandeered by the garrison commanders. The occupation troops got first call on this food. Although it was common practice to use this food as pay for workers engaged in dismantling industrial equipment, when the troops departed they took with them all the remaining supply.

It is difficult to estimate accurately the amount of house furnishings, office equipment, privately-owned automobiles, hospital and school equipment, and libraries, as well as personal property which was removed by the Soviets. In all industrial areas the Japanese had constructed dormitories and housing units for their workers. These were substantial, well-designed brick apartment buildings arranged with several forming a housing unit, widely spaced in orderly blocks—comparable to the better modern industrial housing units in the United States. Throughout Manchuria there were thousands of these buildings. Probably ninety percent of these buildings have been reduced to outer walls, chimneys and some sections of roofs. They were first stripped of their furniture and valuables by Soviet troops, then major damage to walls, floors, etc., was done by mobs in search of hidden valuables and fuel.

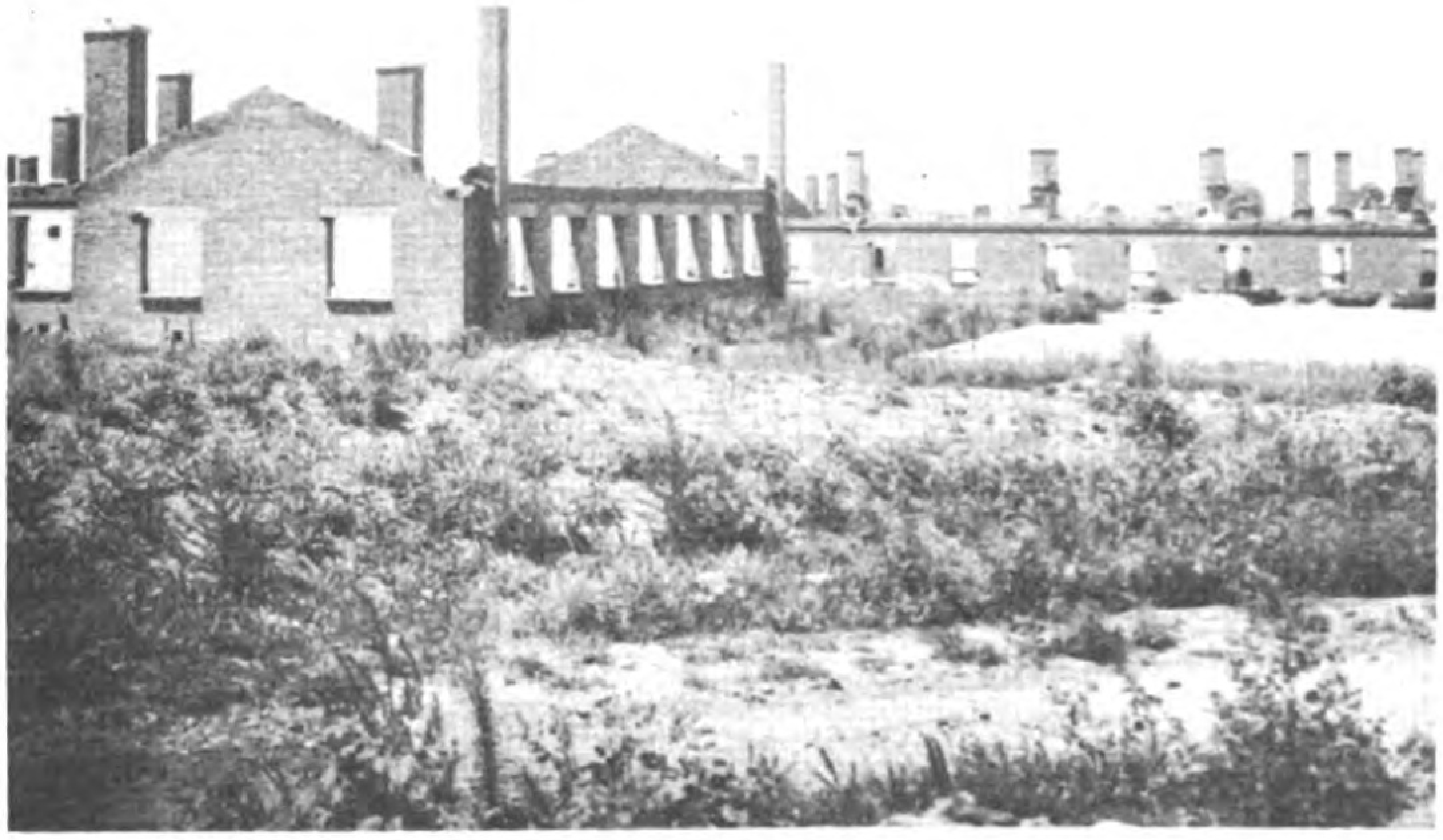
At Changchun the Japanese had built an imposing capital for Manchukuo. The government buildings were modern steel and concrete structure. Excellent modern housing was built as homes for the ruling Japanese and their Manchurian puppets. Most of these buildings are now a mass of debris. According to the Chinese the destruction of the governmental buildings was done by the Soviet troops. They first removed all usable equipment and then since the buildings were comparatively fireproof, fired the rooms one by one. The destruction of the housing was accomplished both by the Soviets and by Chinese mobs. Fighting between the Chinese National forces and Chinese Communists after the Soviet withdrawal resulted in some further damage, but by far the largest destruction occurred during the Soviet occupation.

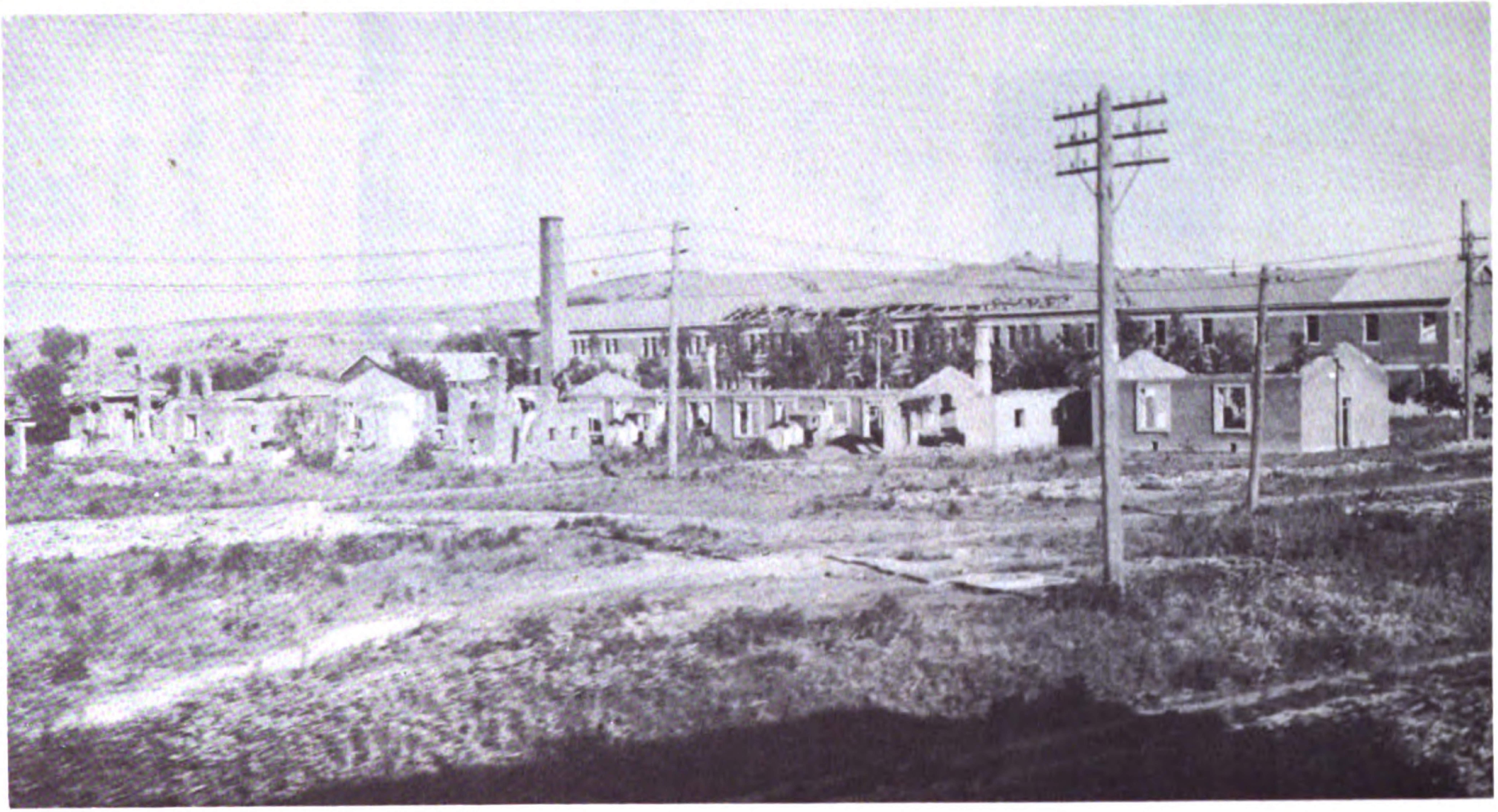
Both at Anshan and Fouhsin, cities of about 200,000 population, the departure of the Soviet troops left the inhabitants without food-stocks, hospital facilities or modern transportation. Law and order have broken down, and the means of livelihood of whole areas has been destroyed.

# RUINS OF INDUSTRIAL HOUSING



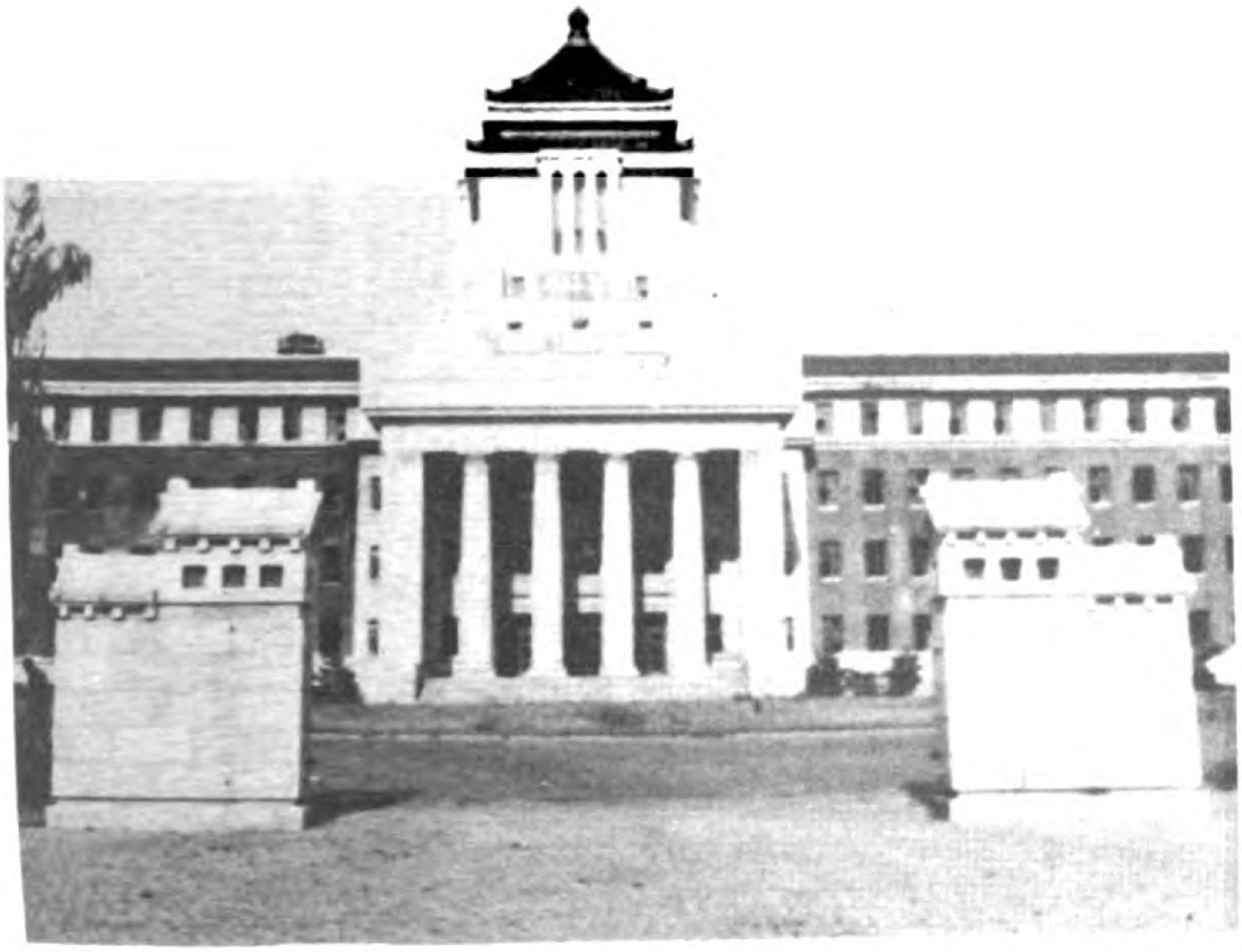
**Housing units** reported destroyed by Chinese looters. This type of housing, mostly for industrial workers, existed in all the industrial cities of Manchuria. After initial looting by Soviet troops and Chinese, the wood was removed for fuel.

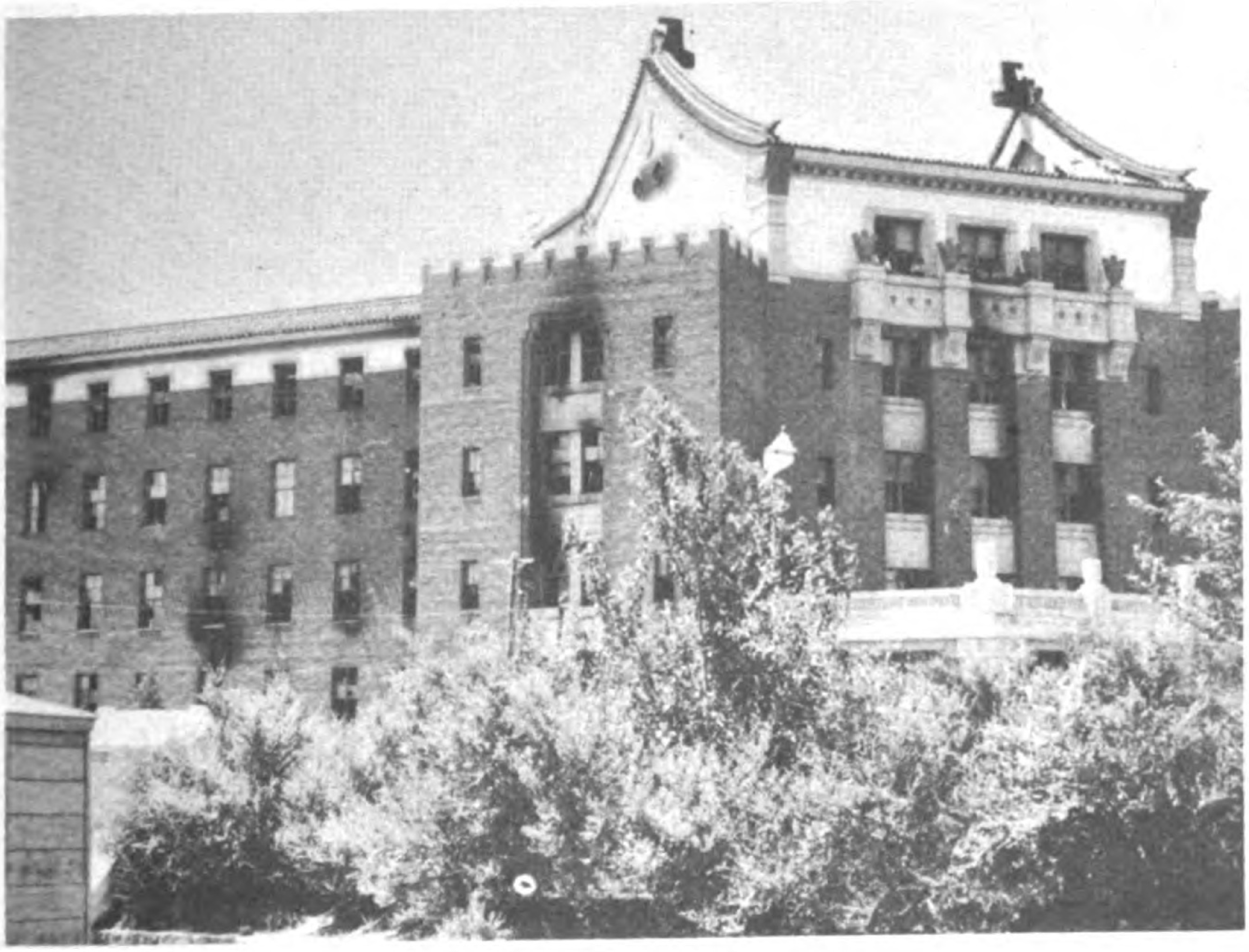




Industrial housing wrecked at Hsian.
This was reported to have been done
by Chinese looters.

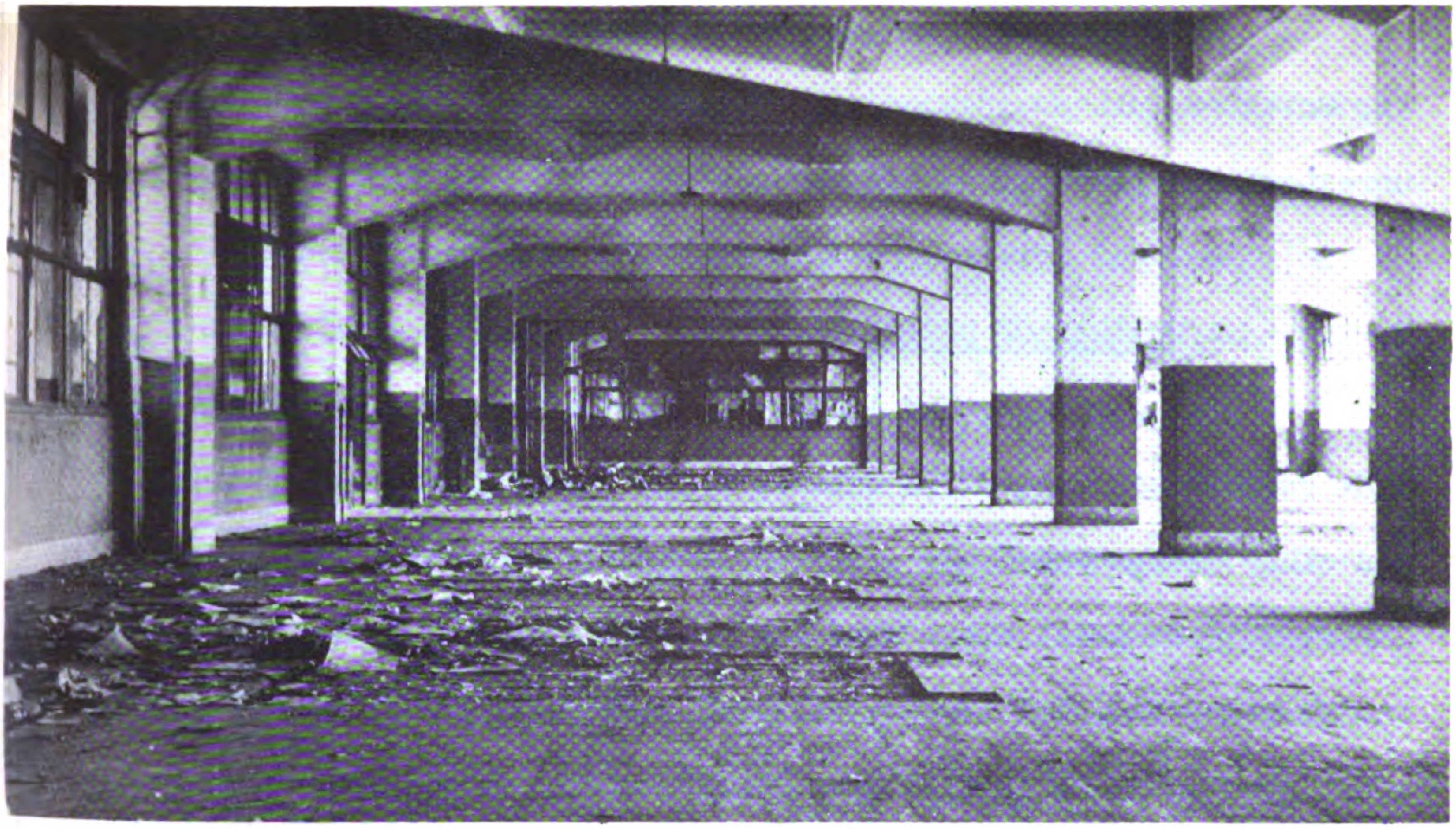
Entrance to
Capitol at
Changchun.





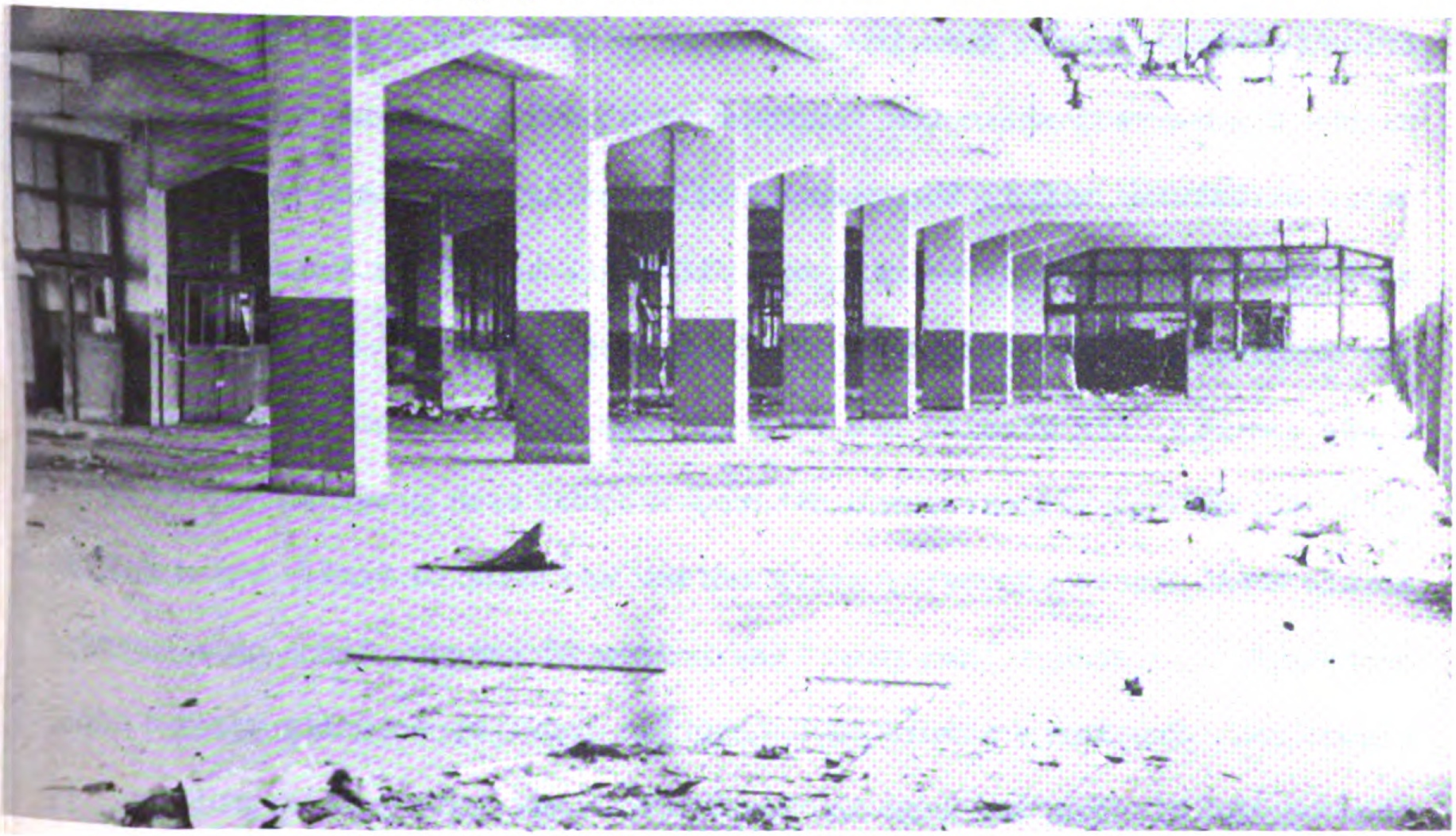
Damaged
Capitol
Building at
Changchun.

Wreckage of interior at Capitol Building at Changchun, reported to have been burned by the Soviets.



Manchurian Govt. Printing Plant - Changchun

One of six main printing rooms completely stripped of all machinery by Soviets.



Printing presses of latest design in this room were removed by USSR.

If the Soviets planned to delay the economic recovery of the Orient a full generation, and to sow the seeds of violent social unrest, their plans have been successful.

## D. APPRAISAL OF DAMAGE

The engineers and industrial specialists on the Mission have made rough estimates of the value of removed equipment and supplies and other damage which was visible to them in Manchuria. Most of the important industrial areas with the exception of Antung and those in the Kwantung Peninsula were visited by our engineers and a well-substantiated estimate of the damage to the whole of basic Manchurian industry is possible.

As a basis for these estimates, the Mission was able to obtain actual records of the equipment installed in the various industries. These records were in many cases verified by visits to the plants themselves, where the foundations of the equipment removed and other structures within the plants could be inspected, and the removals verified. On the other hand it was difficult to verify the amounts of raw materials and other stores which had been removed. For evidence on these amounts, the Mission had to rely upon reports from and interviews with individuals, Japanese and others, who had been present when the removals took place. However, every effort was made to verify these statements and to discount them when they indicated exaggerations or a biased viewpoint. The large sample of Manchurian industry actually visited and seen by the Mission was used as a control in estimating the condition of the plants in the areas where a direct inspection was not feasible.

While the Mission's estimates were made independently, all possible sources were used and checked against each other. Among these sources is a "Summary List of Industrial Equipment and Material Removed by Soviet Forces" prepared by the Northeastern Economic Commission of the Chinese National Government. This document is included in Appendix 2 of this report.

Some of the equipment and material remaining in Manchuria can be salvaged for new installations there or in other parts of China. At the present time, however, they are of little value and the difficulties of moving them are great. The salvage value of these items is minute when compared to the total damage to industry. Unless this equipment and material can be quickly utilized, they will deteriorate and may become a total loss.

The value of the properties removed by the Soviets is probably one-tenth of the amount of damage and economic collapse resulting from these same removals. Many of the items removed were key installations. The removal of one essential item often stopped production in an entire plant. The loss of continuing production in the disabled plants and the loss in livelihood of the workers will be felt for years to come.

Estimates of the total assets of Japanese corporations in Manchuria run from 10 to 12 billion yen. These estimates are based upon Japanese accounting practices which vary greatly from U.S. standards. The estimates apply only to the large industries and do not include the large amount of real and personal property owned by Japanese nationals which has been destroyed or has disappeared and therefore cannot be used as reparations.

At least one-third of the original Japanese investment would be required to restore the damaged and destroyed plants to their original productive level. This does not take into account further deterioration and the loss of production before the old level is reached. These would probably double the cost. Taking all this into consideration, two billion U.S. dollars is considered to be a conservative estimate of the damage to Manchuria resulting from the Soviet occupation.

The direct damage to the major basic industries is summarized in the following table:

### SUMMARY OF DAMAGE TO BASIC MANCHURIAN INDUSTRY

| INDUSTRY | Estimated Loss Due to Removals and Damage During Soviet Occupation (U.S. $) | Estimated Percent Reduction in Productive Capacity Resulting from Soviet Occupation |
|---|---|---|
| Electric Power | 201,000,000 | 71 |
| Coal | 50,000,000 | 90** |
| Iron and Steel | 131,260,000 | (51-100)* |
| Railroads | 221,390,000 | (50-100)* |
| Metal Working | 163,000,000 | 80 |
| Non-Ferrous Mining (Coal excepted) | 10,000,000 | 75 |
| Liquid Fuels and Lubricants | 11,380,000 | 75 |
| Chemicals | 14,000,000 | 50 |
| Cement | 23,000,000 | 50 |
| Textiles | 38,000,000 | 75 |
| Paper and Pulp | 7,000,000 | 30 |
| Radio, Telegraph and Telephone | 25,000,000 | (20-100)* |
| TOTAL | 895,030,000 | |

---

* Percentage varies in sub-categories.

** Coal estimates cover only mines visited. These produced 50 per cent of total Manchurian coal.

In addition to the industries listed above observations were made of many other kinds of damage which cannot be appraised in detail. Included in this category are the lumber and miscellaneous small industries; included also would be wide-spread damage to hospitals, schools and other public services. The appalling picture of destroyed housing has already been described but the basis for a separate, comprehensive evaluation was not obtainable.

Following is a summary of damage to industries which has been compiled from the Chapters III to XVI of this report. Figures showing remaining capacity should be qualified for the following reasons. Even under stress of war demand and before the removal of the most modern equipment the Japanese were seldom able to produce up to total capacity. Now with only the poorest equipment remaining and with new management and probably inexperienced direction it is even more likely that actual production will lag behind capacity. The figures showing remaining capacity are merely a measure of the equipment left and not necessarily a measure of actual capacity to produce. At the time of the Pauley Mission survey actual production in all major industries except for coal mining was practically at a standstill because of lack of power and of the interdependence of the various industries.

Electric Power Industry

1. Capacity was reduced from 1,790,000 kw to 780,000 kw.

2. The newer more modern equipment was removed, leaving the worn-out and obsolete equipment. The remaining equipment can only produce at an estimated 55 percent of its aggregate ratings.

3. Well over 70 percent of the Manchurian power was delivered by the hydro plants. Due to Soviet removals only 10 percent or 70,000 kw of the remaining hydro power is being generated and distributed to a limited area.

4. The total estimated loss in dollars in the electric power industry is $201,000,000.

Coal Industry:

Coal production was reduced from 25,000,000 MT/yr to 2,500,000 MT/yr, a loss of 90 percent, and only 25 percent of the amount urgently needed for domestic requirements.

2. Estimated loss to the industry as a result of removals and destruction is $50,000,000 (applies only to mines visited by Pauley Mission).

Iron and Steel Industry:

1. Iron ore mining capacity was reduced from 8,600,000 MT/yr to less than 2,000,000 MT/yr.

2. Iron ore concentration capacity of 2,030,000 MT/yr is completely incapacitated because of loss of quantities of critical equipment such as magnetite separators, motors, etc.

3. Coke making capacity was reduced from 2,800,000 MT/yr to 784,000 MT/yr, a loss of 72 percent.

4. Pig iron capacity was reduced from 2,524,000 MT/yr to 396,000 MT/yr, a loss of 71 percent.

5. Sponge iron capacity was reduced from 112,550 MT/yr to 2,000 MT/yr, a loss of 98 percent.

6. Steel ingot capacity was reduced from 1,330,000 MT/yr

to 580,000 MT/yr, a loss of 57 percent.

7. Semi-finished steel capacity was reduced from 1,000,000 MT/yr to 500,000 MT/yr, a loss of 50 percent.

8. Finished steel capacity was reduced from 860,000 MT/yr to 274,000 MT/yr, a loss of 68 percent.

9. Total loss suffered by iron and steel industry is estimated at $131,260,000.

Railroads:

1. Railway shop capacity was removed by an estimated 50 percent.

2. The Chinese National Government is unable to account for 90 percent of the rolling stock which was in Manchuria at the time of the Japanese surrender.

3. Reports from Chinese Nationalist state that 15 percent of the trackage in Communist-held territory was torn up and removed by the Soviets.

4. The estimated total loss is $221,340,000.

Metal Working Industry:

1. Removal of 14,500 machines having a total weight of 100,000 tons and value of $58,000,000 caused an industrial capacity loss of 80 percent.

2. Stocks of finished and unfinished materials and auxiliary tools and equipment used in connection with the above machinery which were removed had an estimated value of $58,000,000.

3. Furnaces, cupolas, welding equipment, cranes, and handling equipment, laboratory equipment, electrical and auxiliary

equipment were removed or damaged to the extent of an estimated value of $47,000,000.

4. Total loss to metal working industries is estimated to be $163,000,000.

## Non-Ferrous Mining and Metal Industries:

1. Removal at the mines were nominal as far as is known but very few mines could be visited.

2. All stocks of precious metals were removed.

3. Aluminum manufacturing capacity of 7,600 MT/yr was completely incapacitated.

4. Capacity to produce other non-ferrous metals was reduced by 75 percent primarily because of removals of transportation facilities, electric power equipment and supplies.

5. Estimated loss due to removals is $10,000,000.

## Liquid Fuels and Lubricants:

1. Capacity for manufacture of liquid fuels was reduced from 6,279,000 bbl/yr to 1,570,000 bbl/yr, a loss of 75 percent.

2. Estimated value of loss due to removals is $11,380,000.

## Chemical Industries:

1. Acid and alkali capacity, excluding 623,600 MT/yr located at Dairen under Soviet control, was reduced from 250,000 MT/yr to 198,000 MT/yr, a loss of 20 percent.

2. Electro-chemical manufacturing capacity was reduced by 95 percent, leaving an estimated 500 tons per year intact.

3. Capacity for rubber manufacture was reduced from

11,160 MT/yr to 600 MT/yr, a loss of 95 percent.

4. Explosive-making capacity was reduced from 20,000 MT/yr to 5,200 MT/yr, a loss of 75 percent.

5. Capacity for manufacture of industrial gases was reduced by 60 percent.

6. Capacity for the manufacture of miscellaneous chemicals not included above was reduced by 50 percent.

7. Capacity for glass manufacture was reduced by 60 percent.

8. Capacity for cigarette manufacture was reduced from 24 billion per year to 16 billion per year, a loss of 33 percent.

9. The total loss due to removals is estimated at $14,000,000.

Cement Industry:

1. Cement manufacturing capacity was reduced from 2,200,000 MT/yr to 1,100,000 MT/yr by removals of major equipment. Reduction in capacity, 50 percent.

2. Estimated value of loss due to removals is $23,000,000.

Textile Industry:

1. Very few cotton spindles were removed but about 80,000 are reported to have been destroyed by fire.

2. A large quantity of finished cotton cloth valued by Chinese at 336,000,000 Manchurian yuan was taken.

3. The stripping of the principal woolen textile plant in Mukden removed 90 percent of such equipment from Manchuria. The Plant had an annual capacity of 1,500,000 yards of fabric, 100,000 dozen hats and 33,000 square yards of matting.

4. Finished woolen goods valued by the Chinese at 132,000,000 Manchurian yuan were removed.

5. Total estimated loss to the textile industry is $38,000,000.

Paper and Pulp Industry:

1. Pulp making capacity was reduced from 126,000 MT/yr to approximately 88,200 MT/yr, a loss of 30 percent.

2. Capacity of paper industry is not believed to be seriously affected by removals but many plants could not be visited.

3. Total loss to pulp industry is estimated at approximately $7,000,000.

Lumber:

1. Most of the saw mills are in Chinese-Communist occupied territory. Equipment of those observed in Nationalist territory was 95 percent removed.

Radio, Telegraph, and Telephone:

1. Telephone lines were 20 percent removed or destroyed.

2. Telephone and telegraph installations were 50 percent removed or destroyed.

3. Carrier telephone installations for long distance communications were 50 percent removed or destroyed.

4. Broadcasting installations were 90 percent removed or destroyed.

5. Laboratory installations were 90 percent removed or destroyed.

6. The communications equipment manufacturing installations were 90 percent removed or destroyed.

7. Total estimated loss is $25,000,000.

Precious Metals, Currency, and Securities:

1. About $3,000,000 in gold bullion was taken.

2. Approximately 591,030,000 Manchurian yuan from Manchukuo Banks were seized.

3. Approximately 9,700,000,000 Manchurian yuan were put into circulation as occupational currency, which by treaty with China the Soviets will not redeem.

4. The Soviets purchased with occupation notes large quantities of materials and merchandise for removal to the USSR.

5. A number of operable Japanese factories were acquired by purchase with occupational currency through a holding company to which the Soviets now claim title.

## E. THE SINO-SOVIET TREATY OF 14 AUGUST 1945

A Treaty of Friendship and Alliance between China and the Soviets was signed in Moscow 14 August 1945 by Dr. Wang Shih-chieh, Minister for Foreign Affairs of the Republic of China, and Mr. V. M. Molotov, the Peoples Commissar of Foreign Affairs of the USSR. The treaty was accompanied by a number of notes and agreements on aspects of the treaty. An English translation is appended to this report in Appendix 2.

None of the wording of this treaty and agreements can be construed as giving the Soviets authority for the removal of industrial equipment. Nor can they be relieved from responsibility for preserving law and order in the light of their subsequent actions. A few of the salient points of the documents are discussed below.

The Soviet Government in Article V of the Treaty and in an appended note "reaffirmed its respect for China's full sovereignty over the Three Eastern Provinces (Manchuria), and recognizes their territorial and administrative integrity" and agreed "to act according to the principles...of non-interference in internal affairs"...of China. The Soviet Government also agreed to support and aid China "in military supplies and other material resources, such support and aid to be entirely given to the National Government as the Central Government of China".

Thus the Soviet Government freely admitted its full cognisance that Manchuria is an integral part of China and committed itself to support and aid only the Chinese Central Government.

In the agreement regarding responsibilities of Sino-Soviet authorities after the entry of Soviet troops into Manchuria, paragraph 5 states:

> "5. As soon as any part of the liberated territory ceases to be a zone of immediate military operations, the Chinese National Government will assume full authority in the direction of public affairs and will render the Commander-in-Chief of the Soviet forces every assistance and support through its civil and military bodies."

This section by far-fetched reasoning might be construed to place the blame for disorder resulting in looting upon the Chinese authorities. As a matter of fact, practically all the damage occurred during the Soviet occupation and prior to the assumption of Chinese control. 3 December 1945 was the date originally set for the withdrawal of Soviet military forces from Manchuria. This date was extended "at the request of the Chinese Government" finally to 3 March 1946. As a matter of fact instead of aiding an orderly turnover the Soviets continually placed obstacles in the way of the Chinese in their efforts to move into the area military and administrative personnel necessary to reestablish Chinese control. No Chinese forces were permitted to land in Dairen, by far the easiest point of entry. At Yingkow, the next logical port, the Soviets withdrew without informing the Chinese and the port was immediately occupied by Chinese Communists, whether by collusion, as the Chinese claim, or not, cannot be established.

These restrictions forced the Chinese to disembark their forces at Chinwangtao, south of the Great Wall, and to fight their way through Communist opposition to enter Manchuria. Later the Soviets authorized some movement by air into Mukden. Because of shortage of Chinese aircraft this movement was necessarily limited. After Chinese authorities had reached Mukden further restrictions were placed by the Soviet authorities on the size of Chinese military and administrative forces that could be moved initially into the areas to be taken over. This resulted in a number of sanguinary clashes and further destruction when the weak Central Government forces were attacked by Chinese Communists as at Changchun.

It has been contended in some quarters that the Soviets took only what was rightfully their own by the terms of the Sino-Soviet Treaty. The provisions of the specific agreement concerning the Chinese Changchun Railway make it clear that this is not the case.

Among the pertinent provisions are the following:

(1) "joint ownership and operation"

(2) "undertaken by a single management under Chinese sovereignty"

(3) "ownership of the railway shall be in equal shares and shall not be alienable in whole or part"

(4) "The Chinese Government shall bear the responsibility for the protection of the said Railway."

> (5) After thirty years "the Chinese Changchun Railway with all its properties shall be transferred without compensation to the ownership of the Republic of China."

Joint ownership does not entitle either party to unilaterally remove part of the property. These provisions restrict--rather than enlarge upon--the normal privileges which the Soviets would enjoy as a joint owner. If a joint owner can not unilaterally remove part of the property, it cannot be contended that this can be done by a "joint owner" who is holding his interest subject to the sovereignty and protection of the other joint owner, who cannot alienate his interest, and who must turn it over to the other joint owner after a specified period of time.

Not only do the above provisions make it clear that there was no intention to give the Soviets special privileges in this regard --quite to the contrary, they affirmatively establish that in removing any part of the Railway property including rolling stock, repair shop equipment, or in taking any items from the Railway subsidiary plants, the Soviets violated the terms of the Railway Agreement.

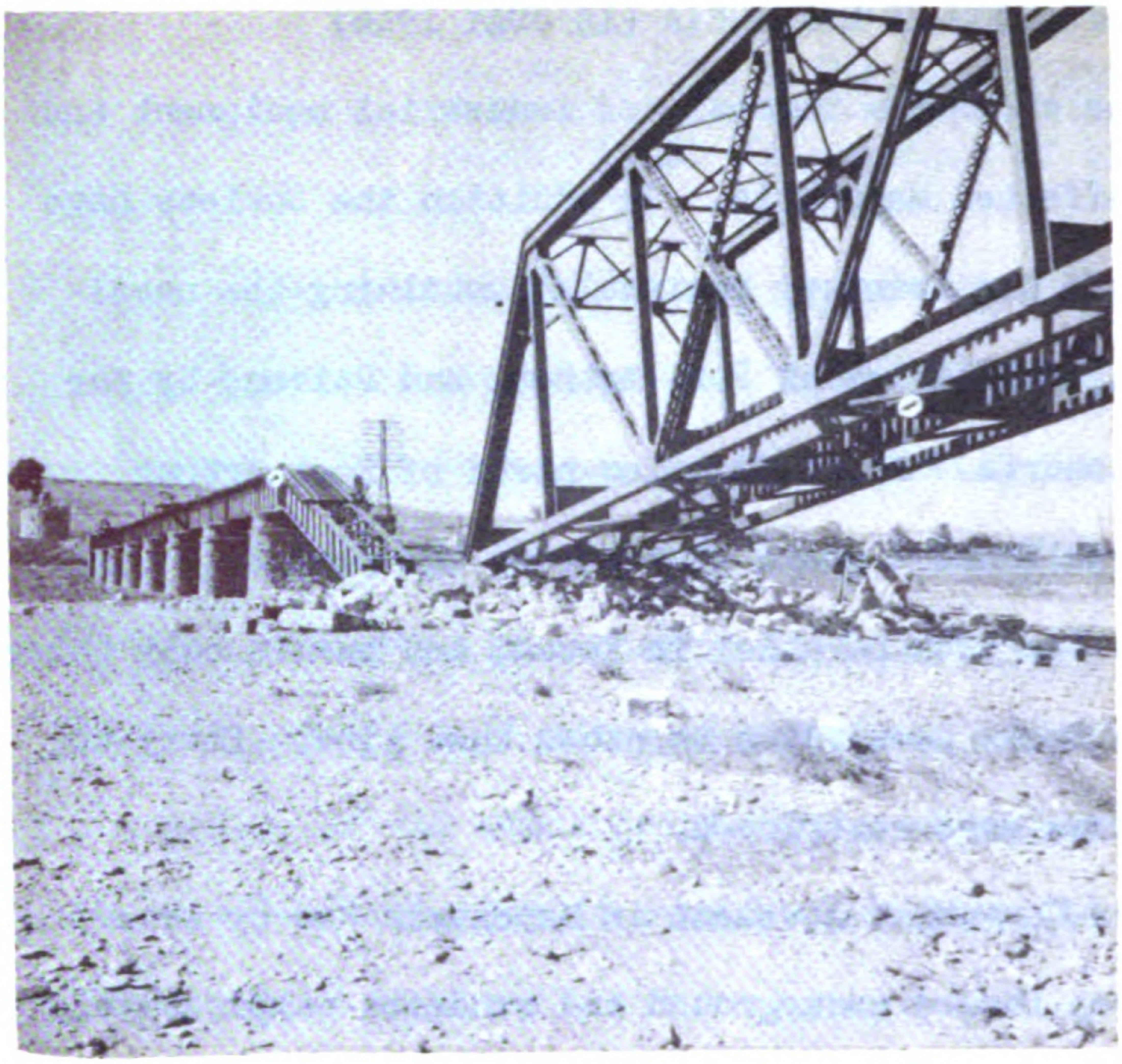
The United States position with regard to Soviet removals in Manchuria is expressed in a note from the Secretary of State to the Soviet and Chinese Governments on February 9, 1946. This note together with the Chinese reply is included in the report in Appendix 2.

## F. PRESENT SITUATION IN MANCHURIA (15 JULY 1946)

It has been shown how removals of industrial equipment and other actions have affected Manchuria. In addition the Soviets have practically sealed off the Kwantung peninsula containing the naval base and shipbuilding facilities at Port Arthur, and Dairen, by far the best port in Manchuria. About 80 miles north of Port Arthur the Soviets have established a guard line across the peninsula similar to their line at the 38th parallel in Korea, and permit only those individuals who have their permission to cross that line. Entry to the area by sea is even more restricted.

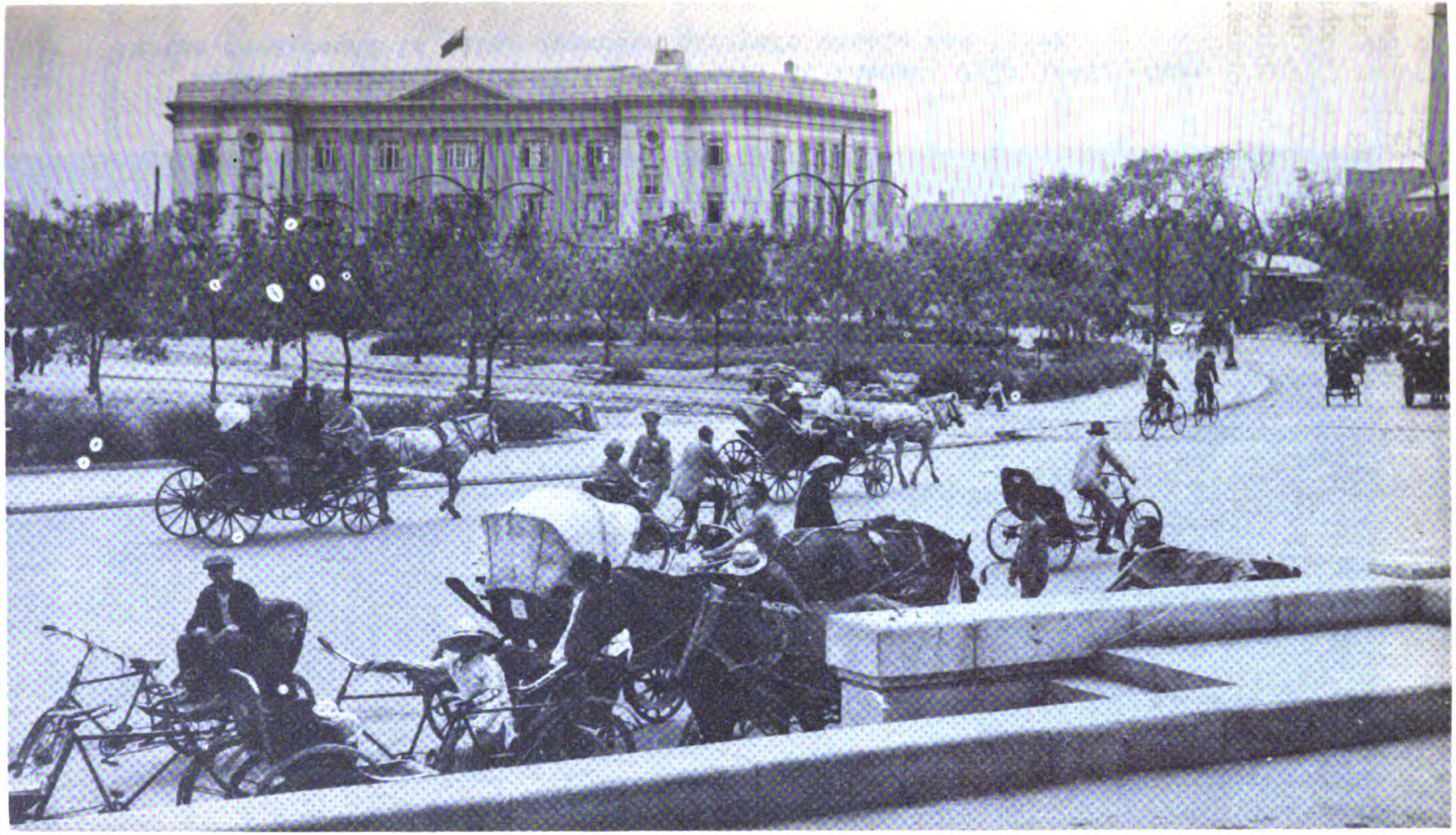
The Chinese Communist movement in Manchuria had by severe Japanese measures been forced underground and rendered comparatively ineffective. Contact with Communist headquarters at Yenan was to all intents and purposes completely cut off. Not until the Soviet entry were there any concrete signs of a Communist resurgence.

At the time of the Japanese surrender, Chinese Communists in general were pre-occupied with their efforts to consolidate a strong base in North China proper and therefore could spare little strength for Manchuria. However, they did send in organizers and propagandists and some military forces. These succeeded in organizing the local Manchurians, of whom some had served as puppet troops for the Japanese, others had been bandits, and still others were genuinely interested in a strong measure of local autonomy. Later more Communist forces were moved north into Manchuria and an intensive recruiting campaign started among the Manchurian Chinese. The hard core of well-indoctrinated and

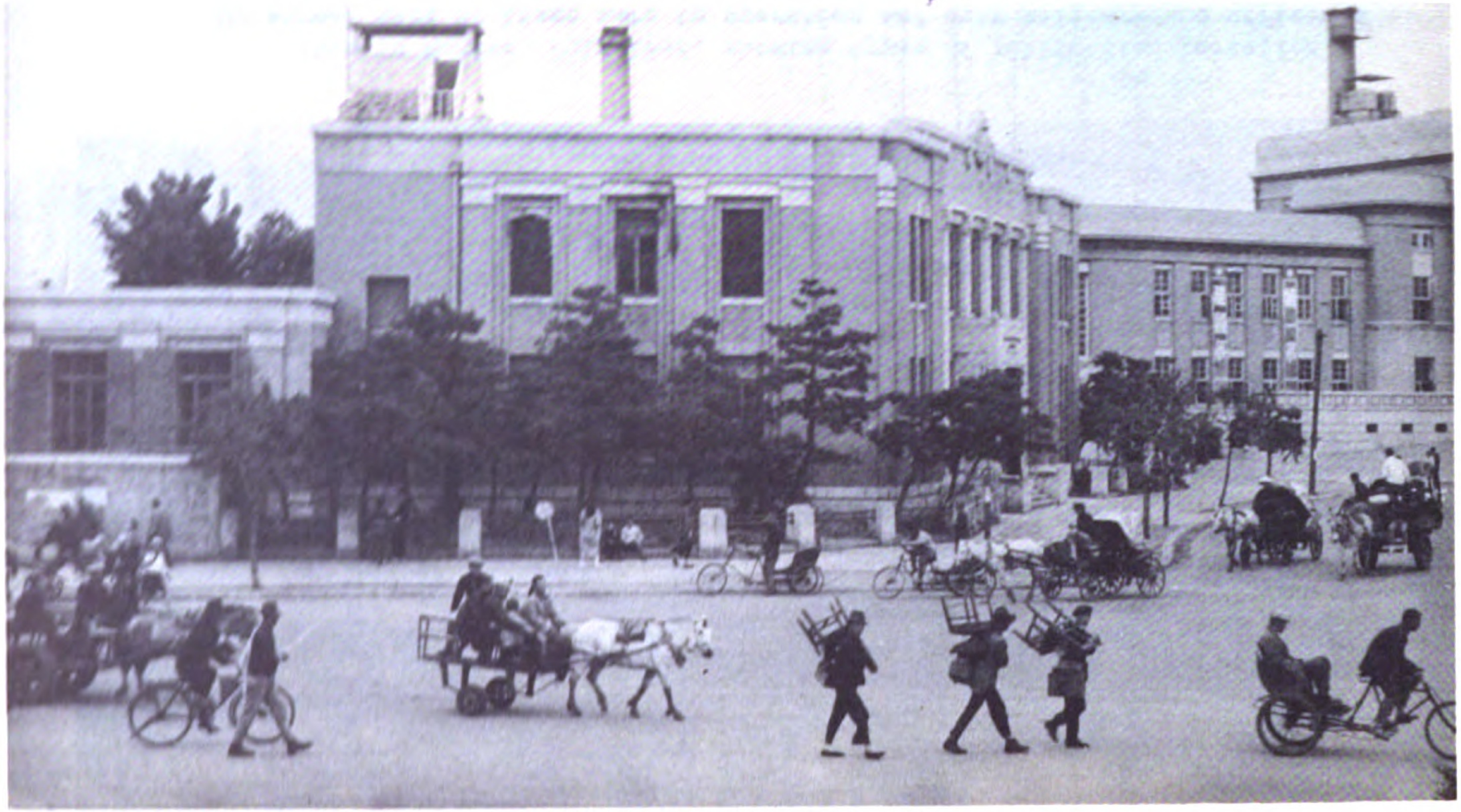


One of the two railroad bridges crossing the Taitzu Ho between Penchihu and Kungyuan, destroyed by Chinese Communist forces.

Temporary bridge built by Nationalists to replace the one described above.



View in Mukden, July 1946, showing types of public transportation. No street cars or buses were in operation and only military and officials were provided with motor transport. Removal of Manchurian power generating and transmission equipment during Soviet occupation has practically halted sanitary, transportation, and lighting facilities for this urban city with a population of approximately two million persons.



Public transportation (all non-motor) in Mukden, July 1946. Cart in the foreground is using Japanese aircraft wheels and tires.

trained Chinese Communist soldiers is still relatively small and the bulk of the so-called Communist troops in Manchuria consists mainly of local residents.

Little direct evidence was found by the Mission that the Soviets aided the Chinese Communists in Manchuria. On the other hand they did nothing to deter them. Large stores of Japanese arms and munitions captured by the Soviets, apparently found their way into Chinese Communists' hands, with or without Soviet cooperation. In area, Chinese Communists now control most of Manchuria. However, the Central Government has most industrialized areas under its control.

Railway communications are at a low ebb. Principal causes are: Soviet removals of rolling stock and of machine tools from the railway repair shops; the destruction by Chinese Communists of many bridges and culverts; the fact that the Chinese Nationalist forces control only the main line of the Peking Mukden Railway, the Chinese Changchun Railway from a point south of Anshan to just north of Changchun, and a small part of some of the feeder lines. All other railway lines are practically in Chinese Communist territory. Remaining equipment and roadbed are in poor condition and only temporary bridges have so far replaced the steel structures destroyed by the Chinese Communists. The lines now under Chinese Nationalist control are subject to constant harassment by Chinese Communists, this is particularly critical on the Peking Mukden line just north of Shanhaikuan.

With Outer Mongolia to the Northwest, Siberia to the North and East, Soviet-held Korea to the South, and the Kwantung peninsula under Soviet control, Manchuria is practically surrounded, and thus vulnerable to further Soviet penetration.

Until a firm peace is established between the Central Government and the Communists, it will be difficult to proceed with the rehabilitation of Manchurian industry. Some of this industry was created by Japan in its war preparation and as a war measure and therefore cannot economically compete with industry more firmly founded. This is the case in some of the iron mining and smelting plants and of shale-oil and synthetic oil production. There is, however, enough immediate and vital need for other production, including coal, foodstuffs, and textiles, to warrant a strong effort to restart these industrial wheels.

# CHAPTER III

# ELECTRIC POWER

## A. PREFACE

### 1. Introduction

This chapter presents a study of the electric power industry of Manchuria including Jehol. Most of the information was obtained in May, June, and July, 1946 during field inspection trips by members of the Pauley Mission, through on-the-spot interviews with plant employees, officials and local residents at or near the plants, and from reports furnished by the Northeast Economic Commission of the Chinese National Government. A great deal of data were secured from Japanese engineers and officials of the Manchurian Electric Company who were still in Manchuria awaiting repatriation when the Mission made its survey. These engineers and officials also prepared and furnished reports on their respective plants.

The data have been checked against all other available material, including Janis, State Department reports, and War Department reports. Particular reference is made to "Principal Electric Power Facilities - Manchuria" prepared by Mr. E. A. Locke, Jr., Special Assistant to the President of the United States, which supplies valuable supplementary information.

### 2. Brief History of the Industry

The establishment of Manchukuo in 1932 found the area with little organized development of electric power supply for the country. Existing installations were small thermal plants located at the power load and were used primarily for city lighting, and in the larger cities for some small industry. In 1934 at Changchun the Manchuria Electric Company was founded with a capital of 90,000,000 yen. This company took over most of the existing power plants in the country during the following two years. In 1940 (an alternate source gives 1944) the Manchuria Electric Company was reorganized with a capital of 640,000,000 yen, amalgamating the former Manchuria Electric Company with the Bureau of Hydroelectric Power Construction, thereby giving one company nearly complete control of Manchurian power.

The Japanese acted swiftly after the creation of Manchukuo to increase power facilities throughout the country under a coordinated master plan for industrializing Manchuria. They first acquired existing plants and increased their capacities and standardized their operation. New thermal plants were built where industrial demands required. Under a program to supply Manchuria with cheap power integrated with the planned expansion of Manchurian industry a survey of the country was made for a comprehensive hydroelectric program and about 50 sites were proposed of which 17 were selected for immediate use. Construction began on this program in 1937. A hydro plant of 37,000 kw was completed and operating at Chingpohu. Another at Tafengmen (near Kirin) had an operating capacity of 283,000 kw and by the end of 1945 was expected to have a capacity of 563,000 kw. A joint project with Korea for the development of power from the Yalu River which forms the border between the two countries had an operative capacity of 600,000 kw of a planned 700,000 kw. Two other sites were under construction on the Yalu River but no equipment is believed to have been shipped to them. By 1945 transmission networks were built for distribution of the hydro power which was fast relegating many thermal plants to the position of standby producers. Power facilities were increased from a national capacity of about 250,000 kw in 1932 to about 650,000 kw in 1940, and in August 1945 the total power reached a rated capacity of 1,790,000 kw. The normal operating capacity available for consumers is below this figure and is estimated at 1,456,000 kw. The results of removals of equipment by Soviet forces during their occupation of Manchuria from Aug., 1945 to May, 1946 reduced the available power capacity 71 percent. The remaining capacity is composed of the older and less efficient machinery.

### 3. Distribution of Plants

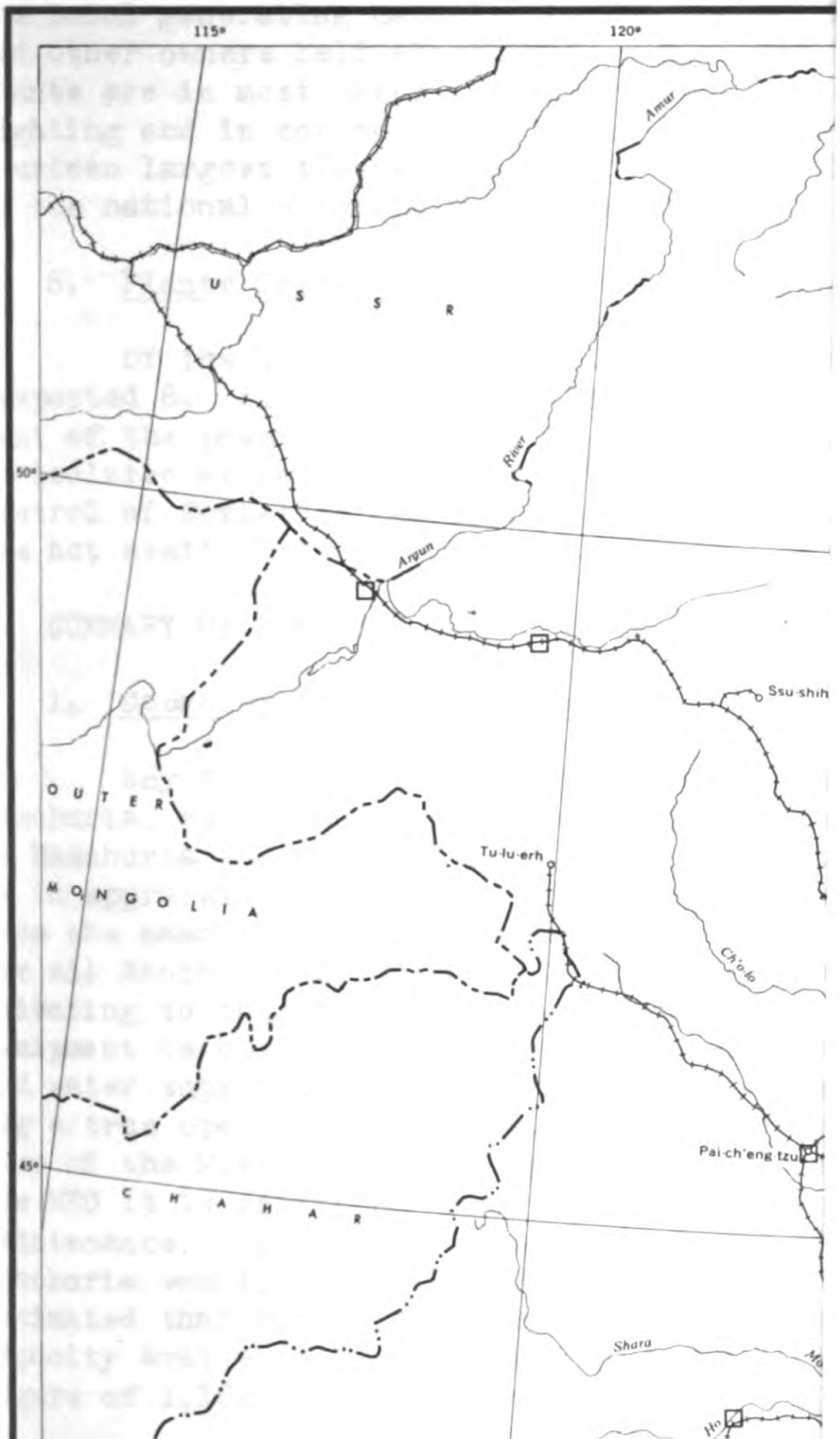
About 75 percent of the total generating capacity is located within a wide strip adjacent to a line from Dairen through Mukden to Changchun which at the same time represents the major industrialized area of Manchuria. Power facilities parallel with industry and located near the industrial centers were characteristic of the developing stages of Manchurian industry. Where industrial plants were located on transportation lines and with coal easily available, power was developed concurrent with specific industrial plants. During the 40's a new trend emerged. The master plan for the industrialization of Manchuria was becoming evident. Tafengmen and the Yalu River hydroelectric projects, with their associated distribution networks, were becoming the important power sources for existing and new industry.

The distribution of main power generating plants and transmission networks are shown on the accompanying map.

### 4. Number of Plants

In the tables plants have been divided into two classes, those owned by MEC (Manchuria Electric Company) and non-MEC or other plants. The latter group is rather small and includes plants owned by other industries which were either government controlled or privately owned plants.

The MEC owned approximately 70 plants, half of which were greater than 1,000 kw capacity. While the total list of non-MEC plants is not considered to be complete the 22 non-MEC plants of greater than 1,000 kw capacity listed represent an appreciable part of such plants. Of


115°
120°
U S S R
Amur
River
Argun
50°
Ssu-shih
O U T E R
M O N G O L I A
Tu-lu-erh
Ch'o-lo
Pai-ch'eng-tzu
45°
C H A H A R
Shara
Ho
UNDER CONSTRUCTION
Lao-ha
Luan
Fou-hsin
Hsin-lu
Chuliuho
Pei-p'iao
I-hsien
Yeh-pai-shou
Jehol
(Ch'eng-te)
Chinchow
(Chin-hsien)
Ta-hu-shan
Kou-pang-tzu
Su-chia-t'
Liao-ya
An-
Hu-lu-tao
Ying-k'ou
Ta-shih-ch
LIAO-TUNG WAN
Ho
40°
Pei-p'ing
Tientsin
Ta-ku
PO-HAI WAN
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
120°

the total generating capacity in Manchuria, MEC owned about 80 percent and other owners held about 20 percent. The large number of smaller plants are in most cases the older plants which were used for city lighting and in connection with small industrial installations. The fourteen largest plants (2 of which are non-MEC) make up 85 percent of the national electric generating capacity.

### 5. Plants Inspected by the Pauley Mission

Of the 14 largest electric power plants the Pauley Mission inspected 8. Altogether, the Mission directly observed about 60 percent of the power industry. The remaining plants were either so small or isolated as not to warrant a trip to them or were in areas under control of Soviet forces or Chinese Communist forces to which access was not available.

## B. SUMMARY OF FINDINGS

### 1. Capacity as of August 1945

Any figure for the total electric generating capacity of Manchuria, as any summary figure, must be based on certain assumptions. In Manchuria these assumptions become significent and must be considered in appraising any figure of capacity. The rated capacity taken from the name-plates of machinery gives the largest figure and totals for all Manchuria 1,786,253 kilowatts. Certain of the equipment contributing to this figure has not been in use in recent years, other equipment is obsolete and worn, and in certain cases there are boiler and water supply limitations which reduce the above sum when considering a true operating capacity. From the combined calculations of members of the Mission, plant operators, and officials and engineers of the MEC it is estimated that, with average quality coal and average maintenance, the practical operating level of power equipment in Manchuria was 1,456,260 kilowatts. Japanese engineers and officials estimated that during 1944, due to the exigencies of war, the power capacity available to meet peak load was limited still further to a figure of 1,162,990 kilowatts.

A comparison of the rated capacity and the operating capacity during 1944-45 shows that thermal plants could generate at about 55 percent of their rated capacity. It is doubtful if even this generating peak was ever attained, for where industry was able to tie into the major power distribution nets (supplied primarily by hydro plants), thermal plants were not operated but were kept only as standby.

Included in the total national capacity is 300,000 kw supplied by the Suiho hydroelectric plant on the Yalu River. This plant was jointly built by the Korea Electric Company and the Yalu River Hydroelectric Company. The latter had about half its capital subscribed by MEC. Reports on the machinery design indicate that two generators (60 cycle) were exclusively for Korea, two (50 cycle) for Manchuria, and three (one of which was incomplete) were dual purpose.

While Janis 75 states that power from this project was distributed on a 60/40 ratio, favoring Manchuria, it would appear that the intent was to develop a versatile power source to be apportioned as industrial requirements demanded. It is quite possible that Manchuria received 60% during the war due to the demands of the steel industry in Anshan. However, there is no indication that an arbitrary ratio was to be adhered to.

The accompanying tables summarize the generating capacities of Manchurian power plants broken down in accordance with the above considerations. Reference is made to the plant summaries and plant inspection reports in Appendix 3. The plant summaries give detailed specifications of generating and boiler equipment and figures and comments on present operation for all known plants in Manchuria.

### 2. Maximum Production

The installed electric generating facilities increased steadily from the founding of Manchukuo up to August 1945. While the maximum installed generating capacity was reached in 1945, maximum production of energy probably occurred in 1943 or possibly 1944. This is suggested by the fact that most other industry, the power consumers, reached a peak production in 1943 and fell off in 1944 and 1945 due to the pinch of the U. S. shipping blockade. Tokyo records report the production of MEC alone as

| | | |
|---|---|---|
| 1943 | 3,700,000,000 | kilowatt hours |
| 1944 | 4,000,000,000 | kilowatt hours |

MEC officials in Changchun (July 1946) state that the MEC and major non-MEC plants together produced

1943 4,475,000,000 kilowatt hours

It seems reasonable to conclude that the total energy production lay between 4,000,000,000 kwh and 5,000,000,000 kwh in 1943 and 1944.

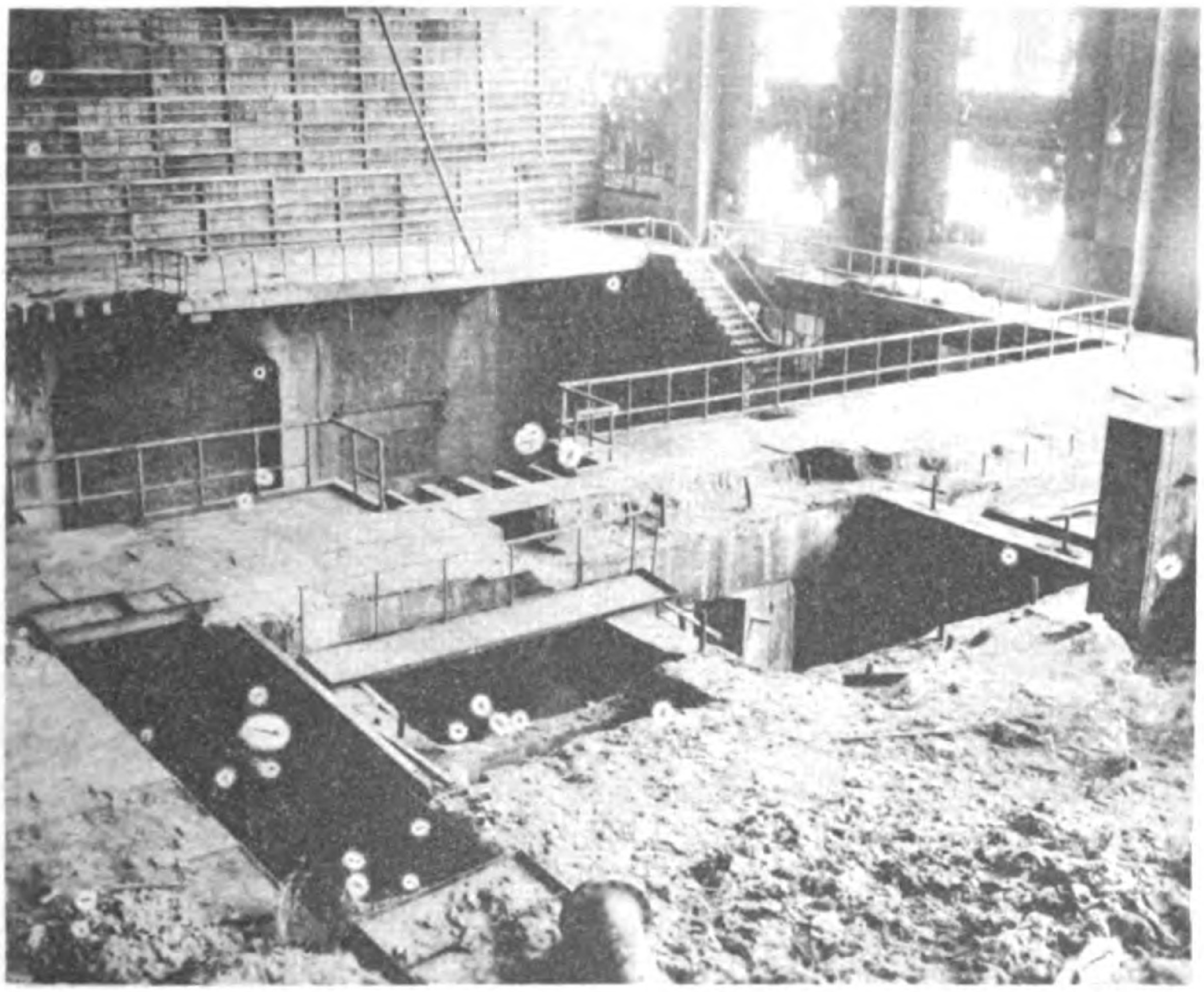
The cost of electric power undoubtedly dropped steadily from the time the MEC took over to the end of the war. The sharpest decrease probably occurred during the '40s as hydro power became widely available.

We find that while in 1945 the weight of investment and capacity remained in the numerous thermal plants, in 1943, when hydro power represented only 30 percent of the national generating capacity it was supplying about 70 percent of the energy load. By the end of 1944 installed hydro capacity had increased 70 percent (from 476,000 kw to 616,000 kw). By August 1945 hydroelectric plants were probably supplying well over 70 percent of the energy for Manchuria.

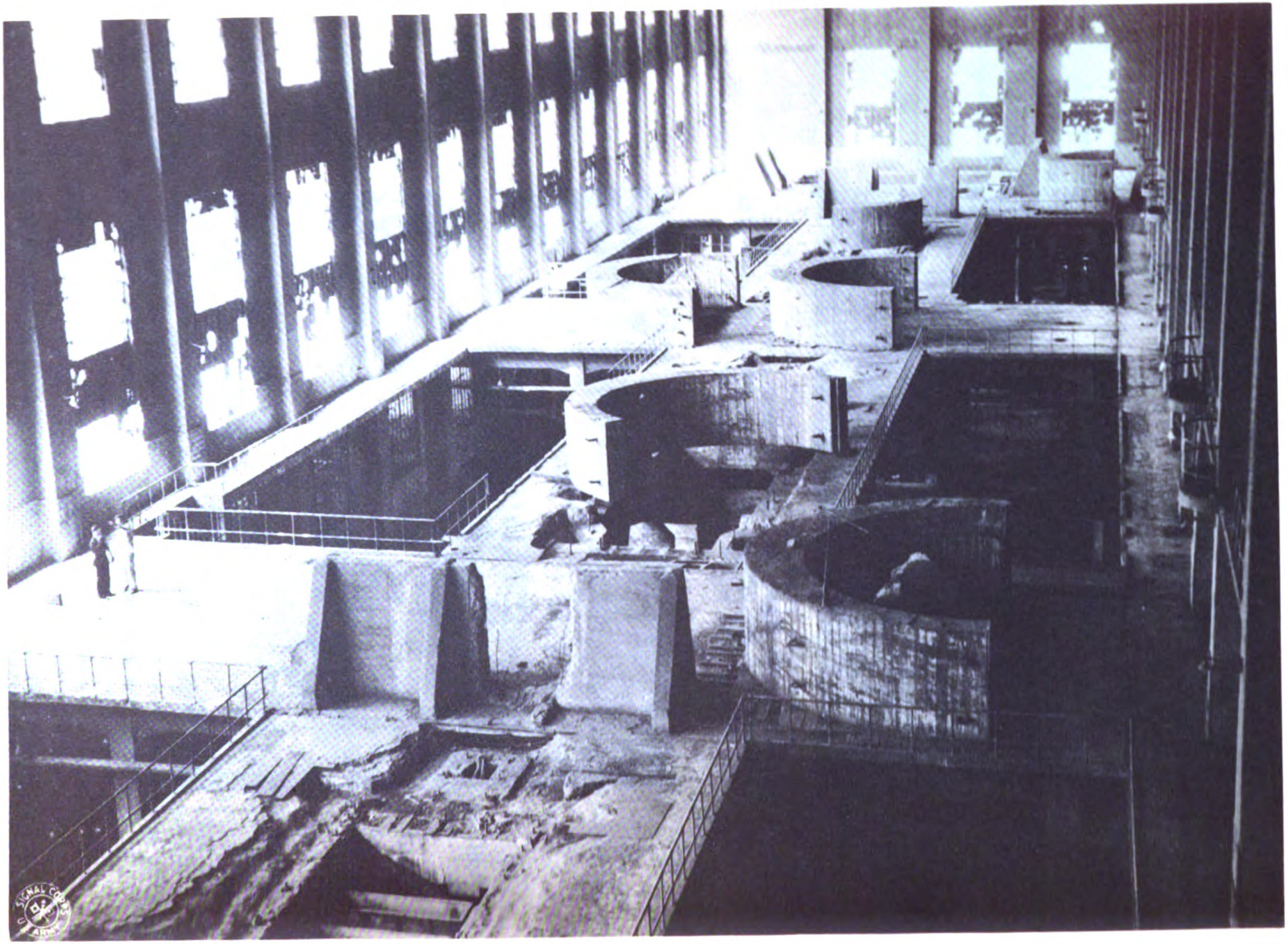
### 3. Capitalization as of August, 1945

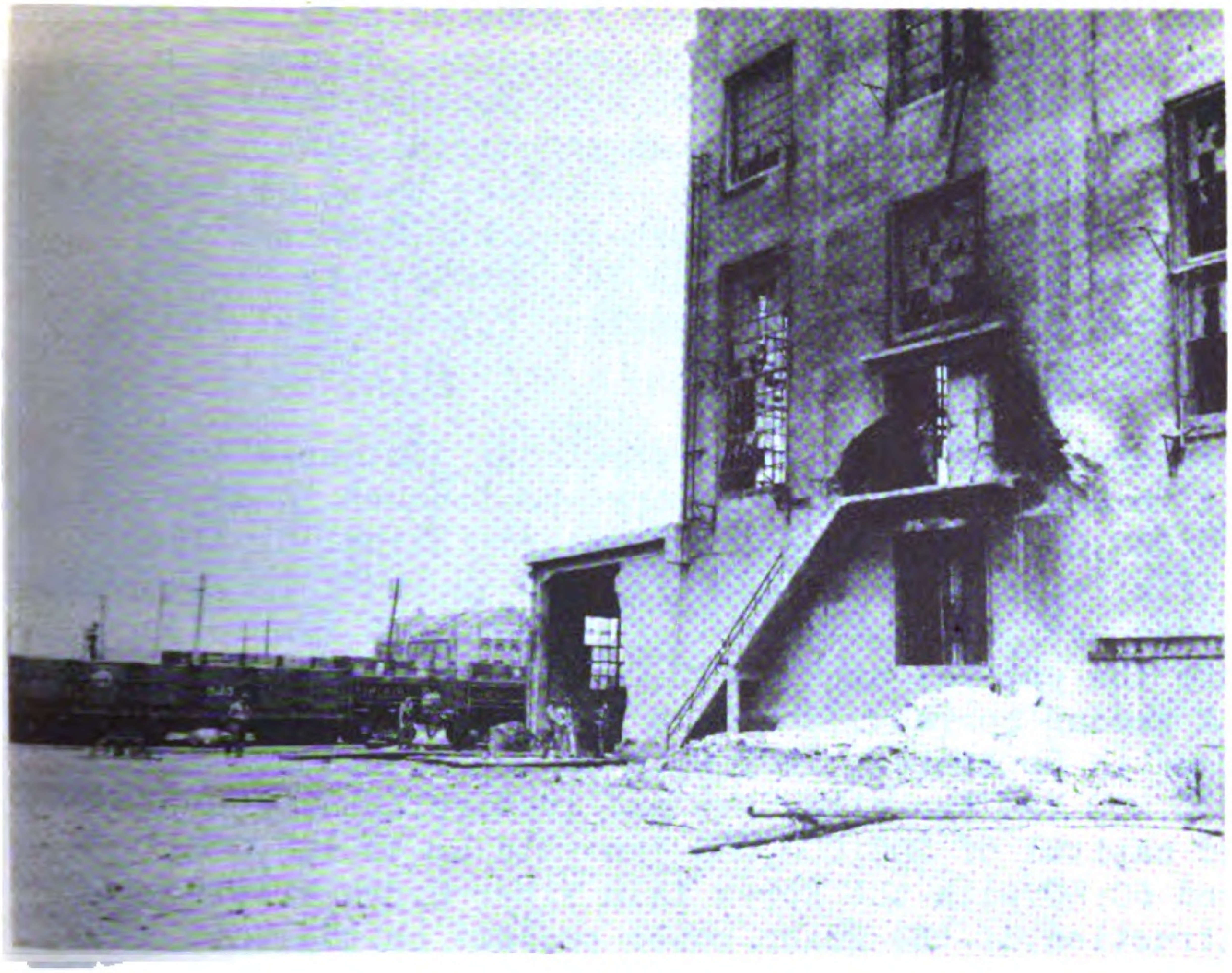
Available sources of information on the financial aspects of the power industry in Manchuria are sketchy and conflicting. However,

FUSHUN POWER PLANT from the Railway Hotel. With a capacity of 285,000 kw this plant produced power for the Fushun coal mines and surrounding area.

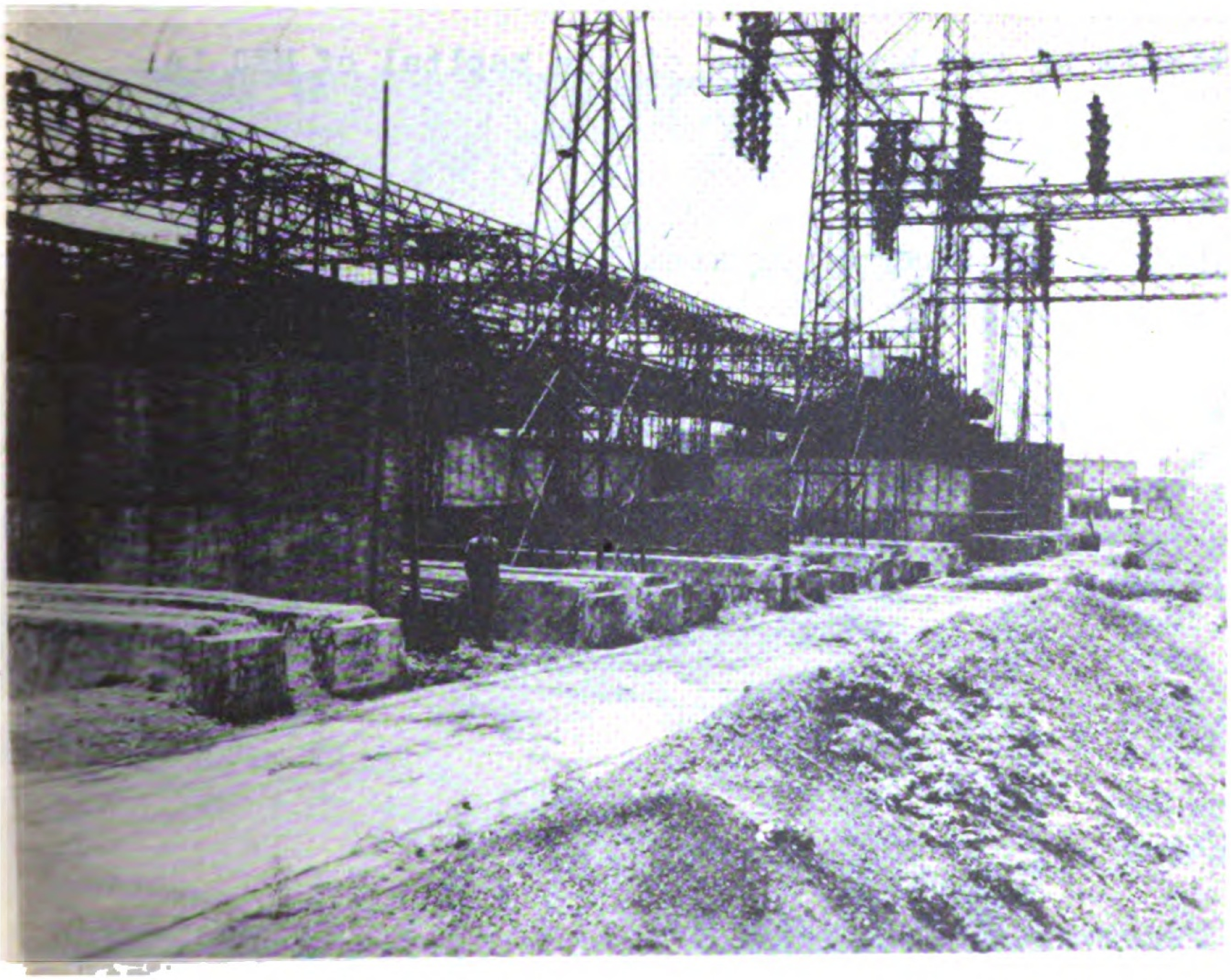


FUSHUN POWER PLANT showing where one of the 25,000 kw generators and its steam turbine were originally mounted (the boiler was mounted on the floor below). Rubble in the foreground is mainly insulating material which came off the steam pipes in the process of disassembly.





Fushun Power Plant, main building, showing entrance through which the boiler and stoker equipment was removed.



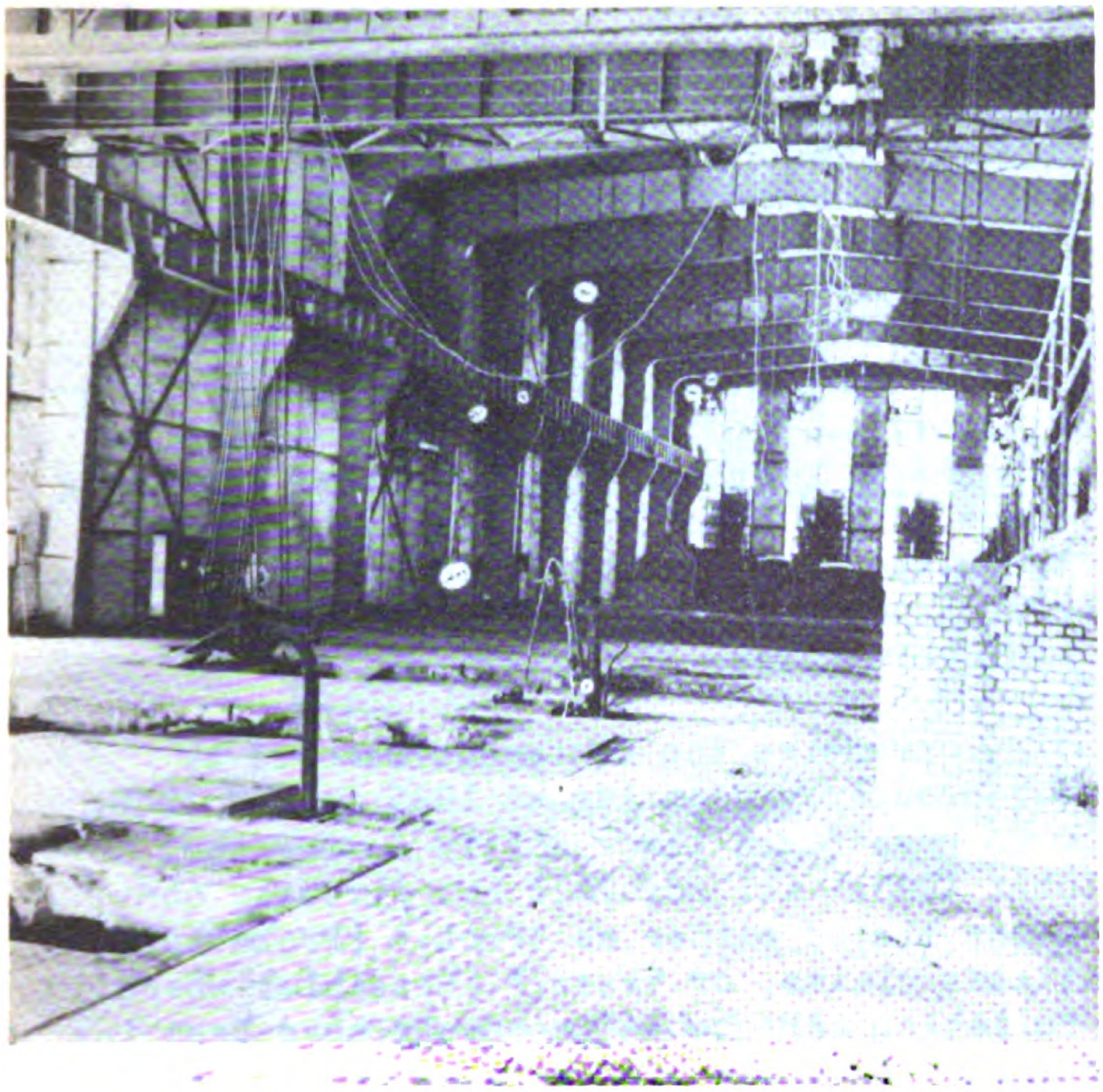
Fushun Power Plant--place in the main bus yard where four 20,000 kva transformers were removed. Dangling line ends to the high voltage bus can be seen in the upper center of the picture.

sufficient information is available to present a generalized idea of the amount and division of capital within the industry. Figures for the value of non-MEC plants are not mentioned here because their value would be included in the values of the various industrial plants of which they form a part. The following figures are estimates based on reports submitted to the Pauley Mission by the Chinese Economic Commission, Japanese former officials of the MEC, and the Yokohama Specie Bank in Changchun. The divergent estimates in the various reports restrict a summary to the following general statements.

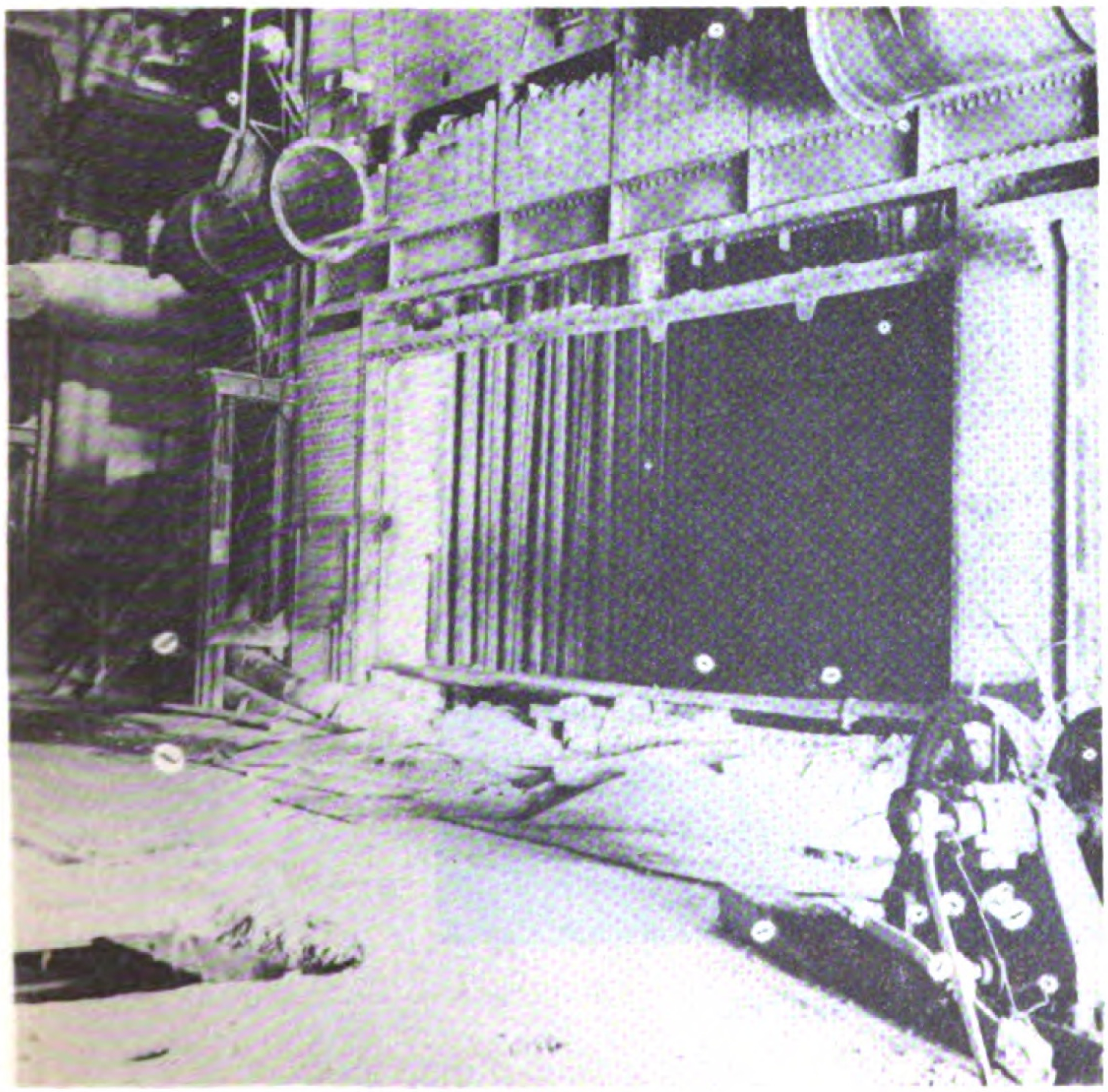
The MEC, a government-controlled corporation, dominated the electric power field in Manchuria. The company was founded in 1934 with a capital of 90,000,000 Yen and was reorganized to include the Bureau of Hydroelectric Power Construction (founded in 1937) in December 1940 with an authorized and paid-up capital of 640,000,000 Yen. (An alternate source puts the capital at 600,000,000 Yen, and the reorganization in 1944). A second company, the Yalu River Hydro Electric Company, was organized in September, 1937 with an authorized and paid-up capital of 100,000,000 Yen (an alternate and less reliable source states an authorized capital of 200,000,000 Yen paid up to 165,000,000 Yen) and participated 50:50 with the Korea Yalu River Hydro Electric Company in the construction of the Suiho power project on the Yalu River. Since the MEC contributed 50,000,000 Yen (or 75,000,000 Yen) of the capital of this company and the fact that MEC controlled distribution of this project's power and held a dominant position as policy former in Manchuria, the Manchurian half of the Suiho power project is presented herein as an MEC controlled plant.

A rough estimate of the break-down of the capital of MEC is presented:

| | | |
|---|---|---|
| Paid-up capital: | | |
| 320,000,000 by Japanese Government | | |
| 320,000,000 - other | | 640,000,000 Yen |
| Investments in other companies | 80,000,000 | |
| Investments in Yalu River Electric Company | 50,000,000 | |
| Power Stations | 260,000,000 | |
| Transmission and Distribution | 220,000,000 | |
| Cash, coal reserves, accounts due and other liquid assets | 30,000,000 | |
| | ¥640,000,000 | ¥640,000,000 |



Manchu Iron Works Power Station #3 showing the former location of two 20,000 kw turbo-generators and control equipment. Everything was removed except one frequency changer visible at the far end of the room.



Manchu Iron Works Power Station #3 showing partial removals from boilers for the above turbo-generators. Coal feeding equipment, grates and some auxiliary equipment were removed. Boiler tubes remain.

### 4. Capacity Loss Due to Removals by USSR

The electric power industry appears to have been the subject of especial consideration in Soviet plans for removal of capital equipment from Manchuria. Of a total installed rated electric generating capacity of 1,786,253 kw the Soviets removed 56 percent or 1,008,300 kw. In addition they removed 385,000 kw of equipment most of which was in the process of being installed. The larger and newer plants--plants which were supplying the great part of the national energy load--suffered most through Soviet removals. The effect of the removals on industry can be better appreciated by comparing the practical operating capacity under normal conditions to the practical operating capacity found in July 1946. Where there was formerly 1,456,260 kw available for the peak energy load there is now a maximum of 429,550 kw or a reduction of 71 percent in available power.

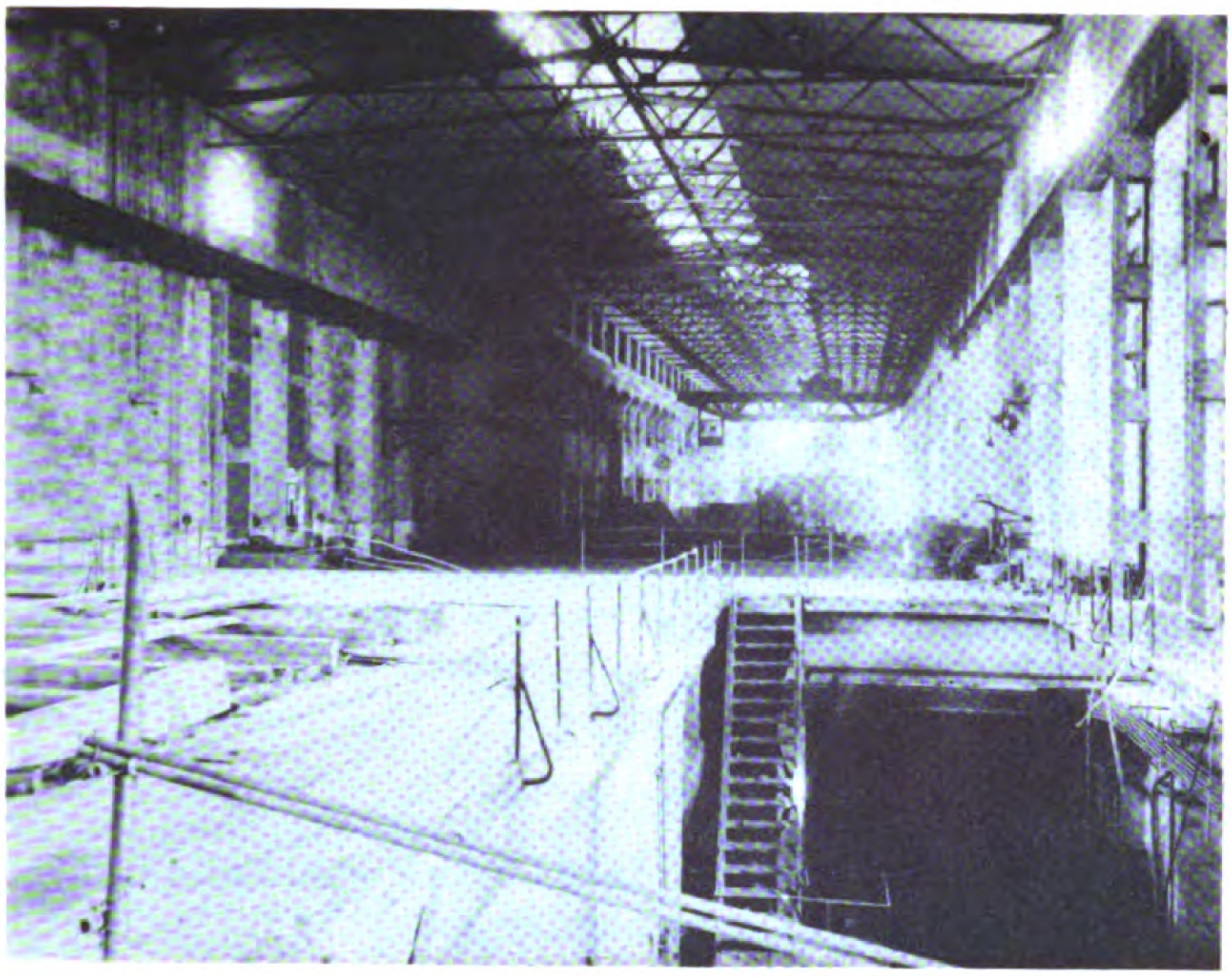
The accompanying tables summarize the equipment removed by the Soviet forces during their occupancy from August 1945 to May 1946. Removals of equipment appear to have taken place mostly during the months of September and October 1945. All removals not directly observed by the Pauley Mission are listed either as "Prob." (Probable) where good evidence substantiates claims, or "Poss." (Possible) where evidence is not considered reliable. "Probable" removals have been included in the total of removals. "Possible" removals have been indicated but not added in the total of removals. Where no information was available equipment is considered to be in place.

Reference is made to Appendix 3 for more detailed information on individual plants.

### 5. Estimated Value of Soviet Removals

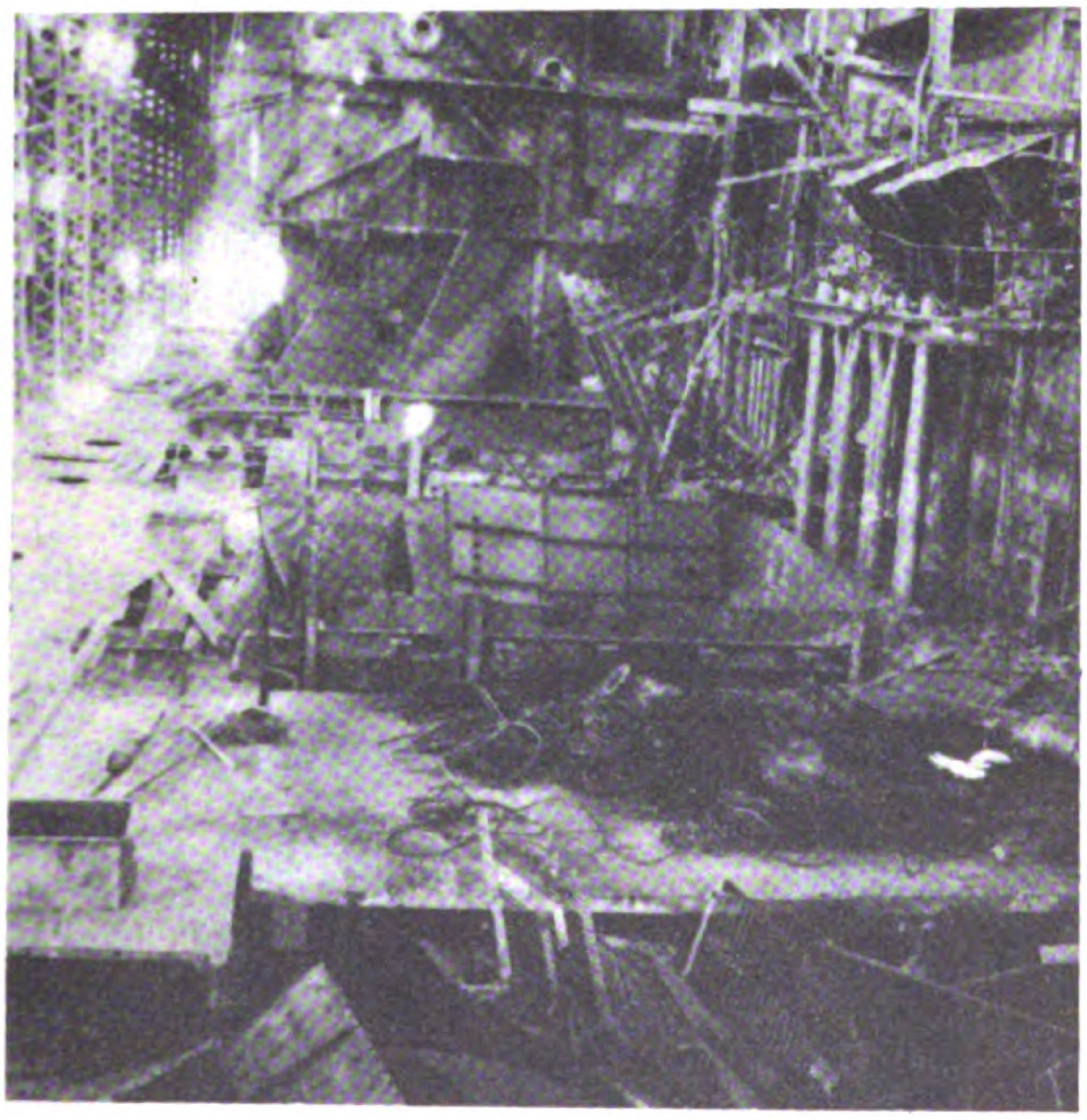
Estimates of the value of equipment removals is presented on a basis of comparative costs of similar construction in the United States though no account has been taken of increased transportation costs for erection in Manchuria. The following figures supplied by the Federal Power Commission are taken as a basis of estimates:

| | |
|---|---|
| Hydroelectric Plant - | |
| Cost of Equipment | $ 50 per kw |
| Cost of Dam | 110 per kw |
| Thermal Plant over 20,000 kw | 115 per kw |
| Thermal Plant under 20,000 kw | 135 per kw |



ANSHAN STEEL WORKS

Main generator and blower room. Soviet removed two turbo generators complete with auxiliary equipment totaling 43,000 K.W. capacity. Two smaller sets with 30,000 K.W. capacity were left in place. Six large turbo blowers for blast furnaces were removed also.



ANSHAN STEEL WORKS

Boiler room where Soviets removed two boilers each capable of producing 110,000 pounds of steam per hour. Partial removals of about 50 percent were made on the eight remaining boilers.

Summarizing Soviet removals and their values:

| | Removals | Cost |
|---|---|---|
| Hydroelectric Equipment | 720,000 kw | $ 36,000,000 |
| *Tafengmen Dam | 12 % | 7,500,000 |
| Thermal Plants over 20,000 kw | 614,000 kw | 70,500,000 |
| Thermal Plants under 20,000 kw | 59,300 kw | 8,000,000 |
| Distribution Equipment | 25 % | 55,000,000 |
| Liquid Assets and Loss to Remaining Installations Resulting from Removals | | 24,000,000 |
| TOTAL Value of Removals | U. S. | $201,000,000 |

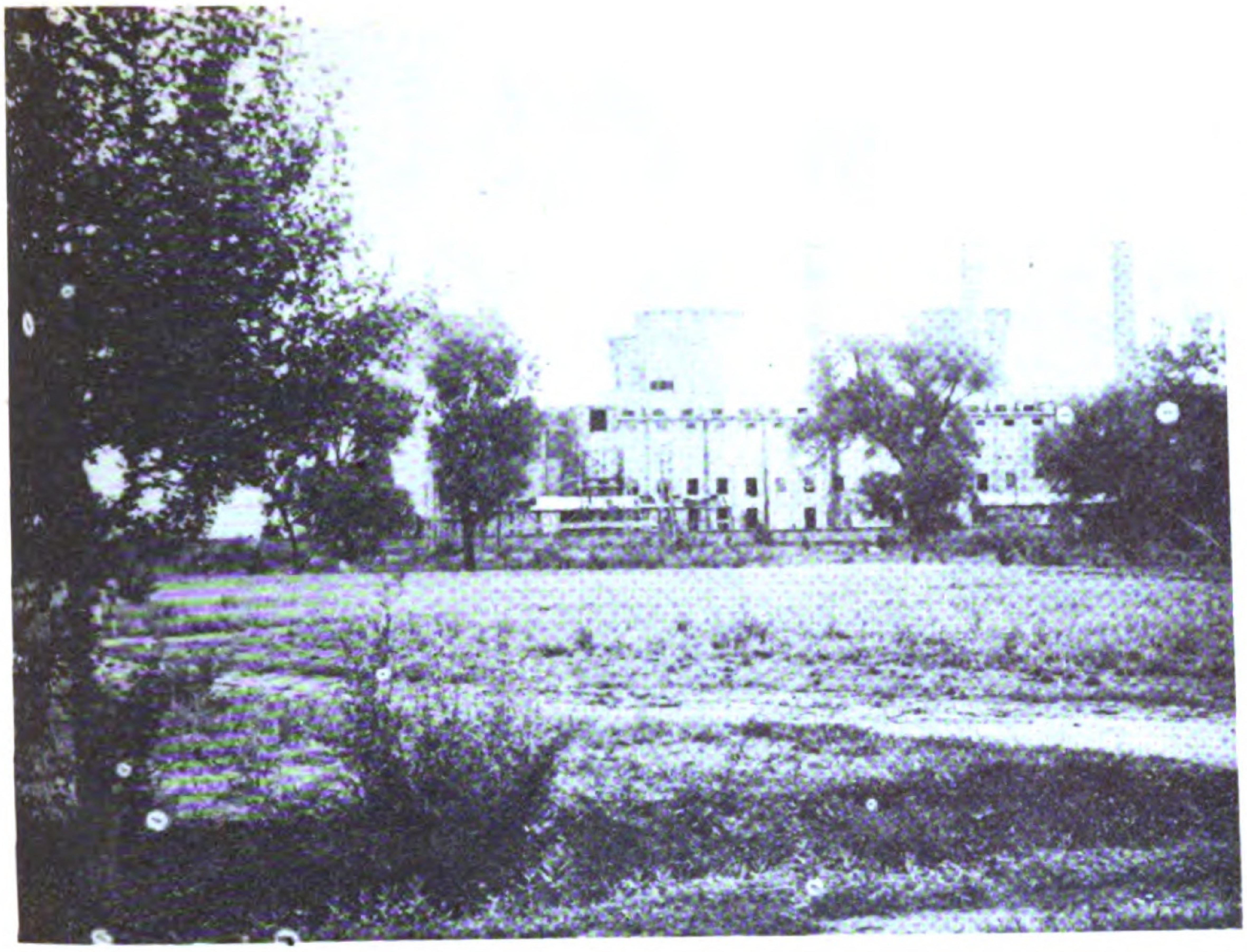
## 6. Present Productive Capacity

It is estimated that power facilities remaining after Soviet removals total, at most, a rated capacity of 778,000 kw, which because of the type and condition of the equipment could not operate at a peak load greater than 325,000 kw. The Pauley Mission directly observed about 60 percent of this equipment. It is being assumed in this report that the unobserved 40 percent remains untouched and available for production, but in a final analysis there may be some doubt of this assumption.

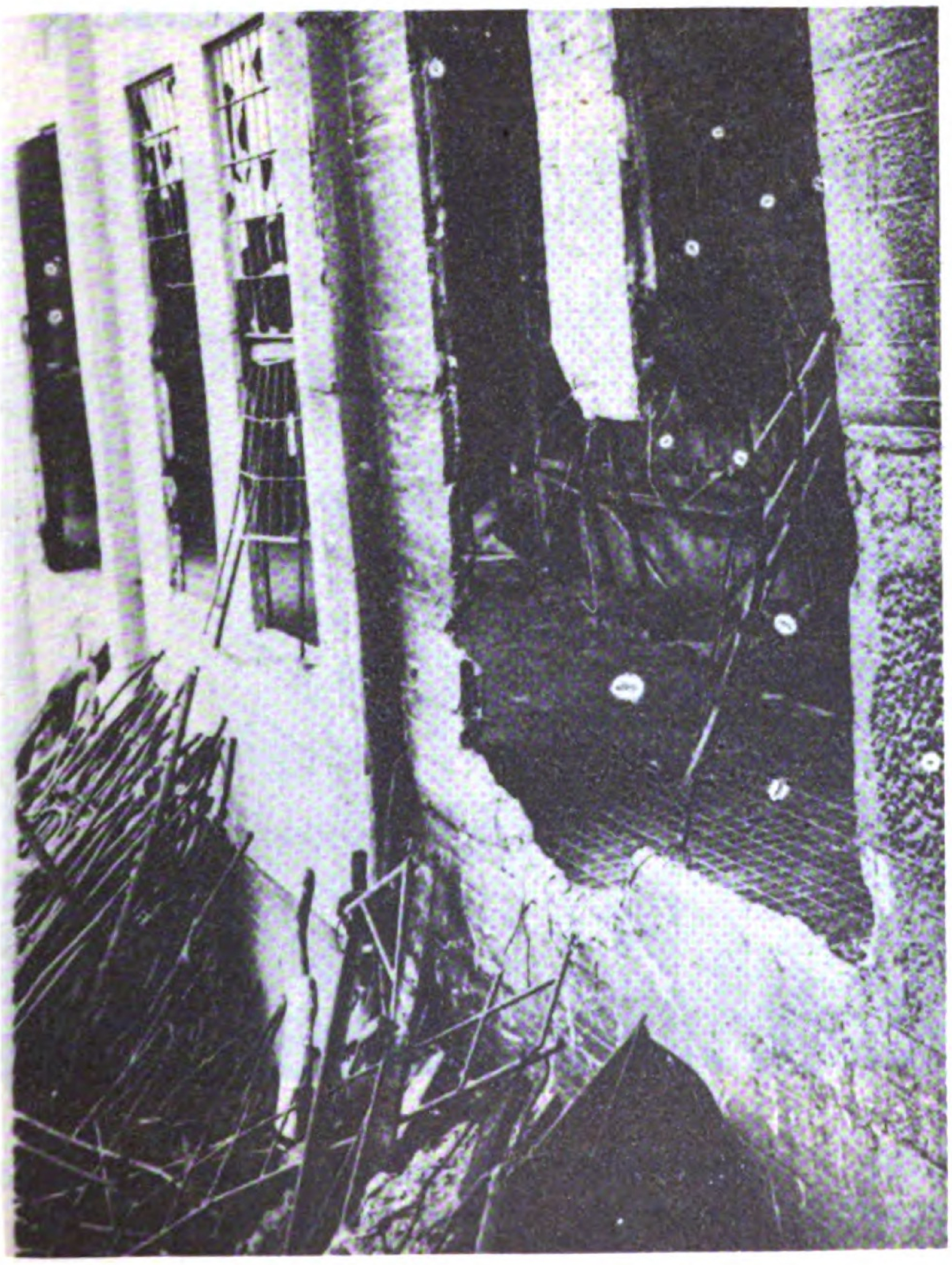
In considering the operative capacity remaining for possible use by industry we find that for hydro power, which was supplying well over 70 percent of the energy load there remains 30 percent of the equipment of which only 70,000 kw can at present be used by consumers in a limited area. None is available from the remaining generating capacity at Tafengmen for the major industrial areas south of Changchun because the Chinese Communists have cut the southern transmission line and will not permit its repair. The only Manchurian area now being supplied by Suiho (in Soviet hands) is reportedly the Kwantung peninsula (also in Soviet hands). The 5 largest thermal plants have been partially or completely removed. With the heart of the industry cut out what remains is scattered, small, and unintegrated plants which had lost their significance as power contributors. The Mission found in Mukden not enough power for more than sporadic household lighting and none to operate the waterworks or streetcars. In many cities and towns not even enough power is available to supply public or household lighting. For industrial purposes there remains no sizeable power supply available.

---

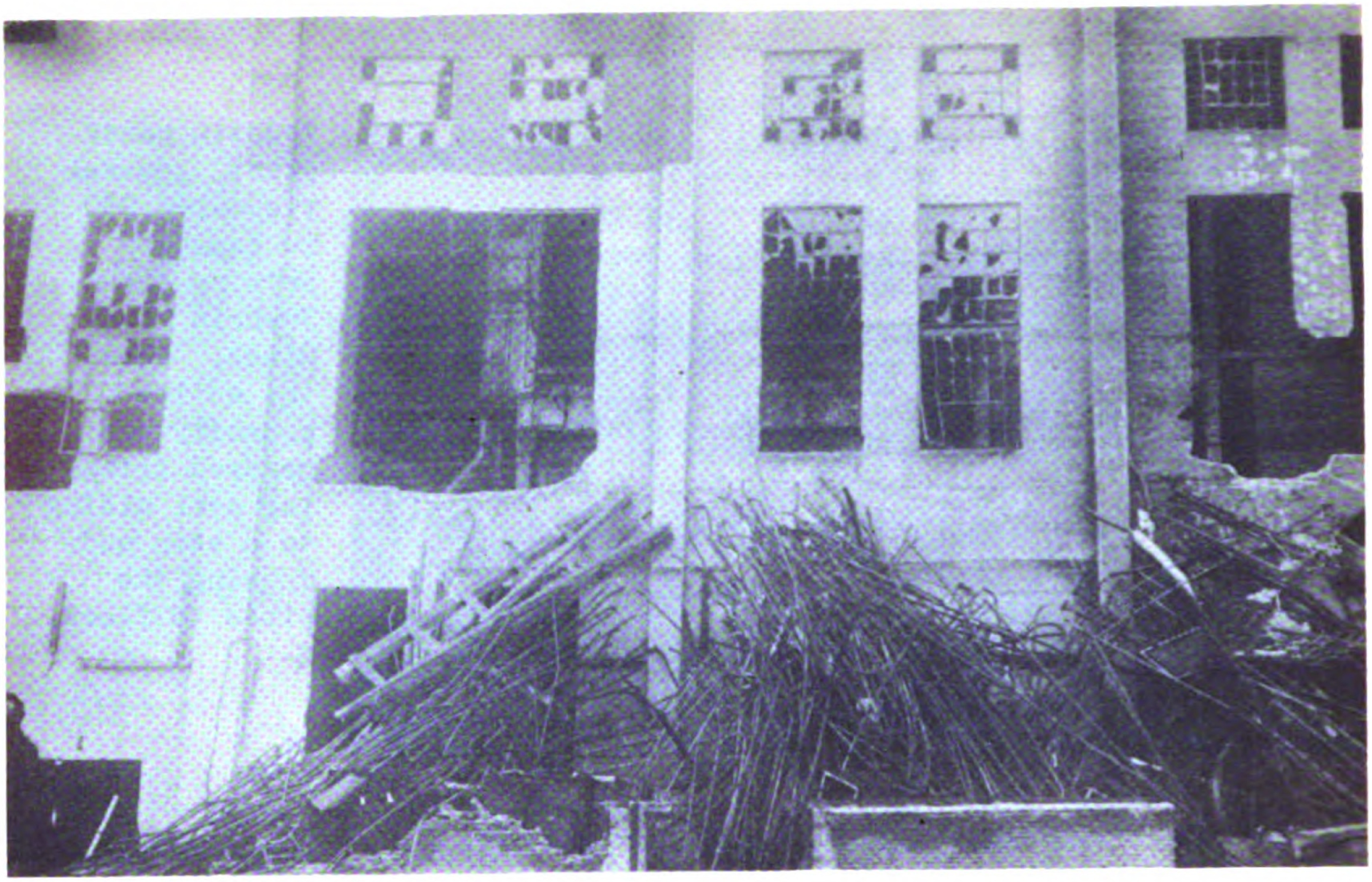
* 12% of designed size of dam, which was 563,000 kw.



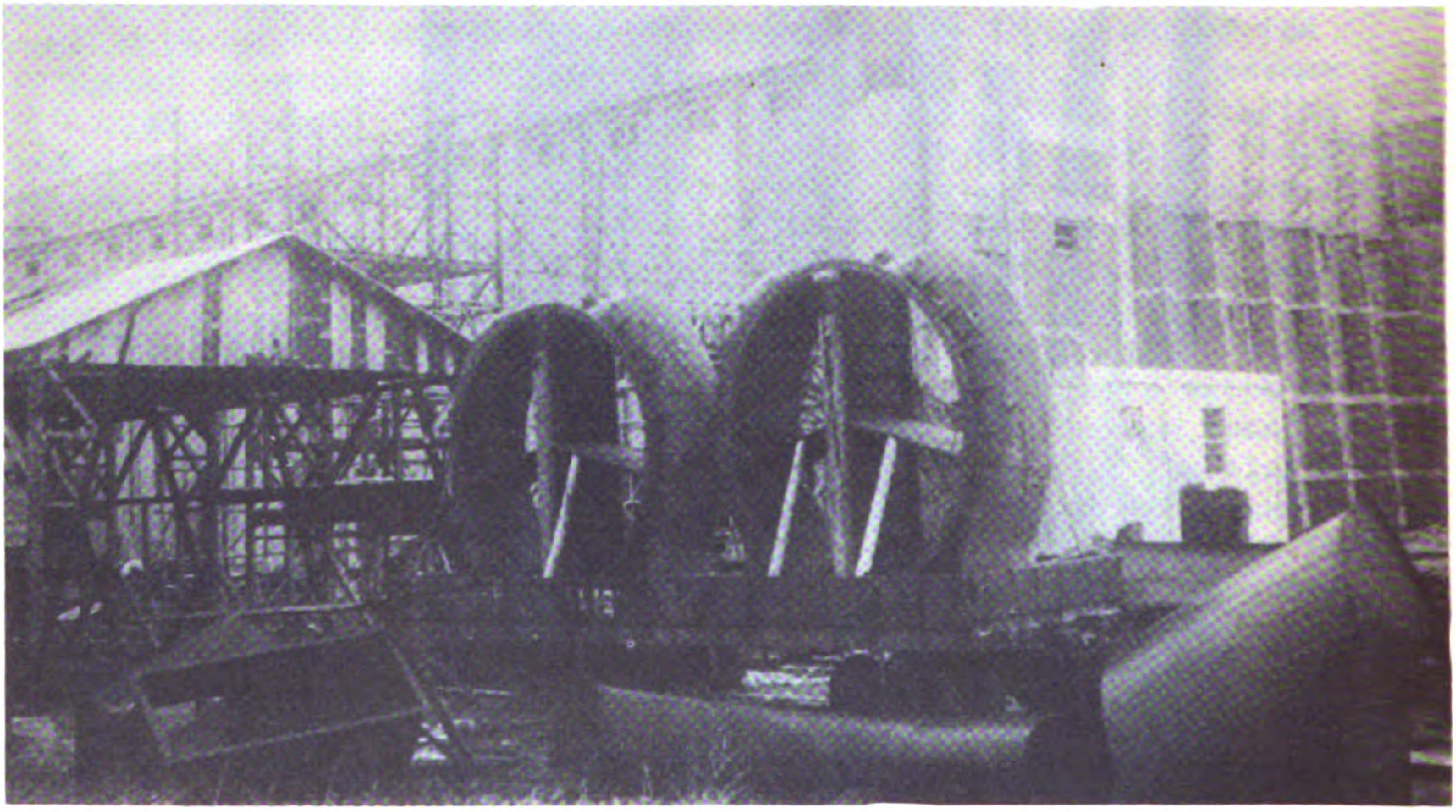
Fouhsin power plant, general view—160,000 kw capacity serving the Fushsin coal mines. Here the entire capacity was removed bringing coal mining to a stop and causing the mines to flood.



Fouhsin power plant showing side of building through which equipment was moved. Railroad tracks were also laid into the buildings to facilitate removels.



FOUHSIN POWER PLANT - Debris around premises indicating great haste and rough handling of machinery.



FOUHSIN POWER PLANT - Heavy cast iron turbine parts loaded on flat car in power house yard. These parts were probably left by the Soviets because they would not clear a tunnel. They were very crudely loaded and could not have traveled far. The guys are strands of galvanized wire--not cables.

## KWANTUNG-LEASED TERRITORY

### Rated Capacities in Kilowatts

| MEC Plants | Capacity Aug. 1945 | Capacity Removed | Capacity Remaining | Practical Operating Capacity Under Normal Conditions | Practical Operating Capacity July 1946 |
|---|---|---|---|---|---|
| Amanogawa | 31,280 | No info. | Prob. 31,280 | 10,000 | Prob. 10,000 |
| Kanchingtze | 83,000 | Prob. 50,000 | " 33,000 | 53,000 | " 20,000 |
| **Non-MEC Plants** | | | | | |
| Kwantung Onoda Cement Co., Kwantung | 5,200 | Prob. None | Prob. 5,200 | Est. 3,600 | Est. 2,900 |

#### LIAONING PROVINCE

| MEC Plants | Capacity Aug. 1945 | Capacity Removed | Capacity Remaining | Practical Operating Capacity Under Normal Conditions | Practical Operating Capacity July 1946 |
|---|---|---|---|---|---|
| Erhtaochiang | 37,5000 | Poss. 37,500 | Poss. 37,500 | 30,000 | Poss. 30,000 |
| Fushun | 285,000 | 210,000 | 75,000 | 190,000 | 25,000 |
| Hsian | 30,000 | None | 30,000 | 27,000 | 3,000 |
| Kaiyuan | 3,500 | 3,500 | None | 3,500 | None |
| Suiho (hydro) | 300,000 | Prob. 200,000<br>plus 100,000[2] | Prob. None | 300,000 | Poss. None |
| Taoan | 3,000 | Prob. 1,500 | Prob. 1,500 | 3,000 | Prob. 1,500 |
| Tiehchangtzu | 1,000 | No info. | " 1,000 | 800 | 800 |
| Tienshihfu | 3,000 | " " | " 3,000 | 3,000 | Prob. 3,000 |
| Tungliao | 2,100 | " " | " 2,100 | 1,200 | " 1,200 |
| Faku | 350 | " " | " 350 | 300 | " 300 |
| Kaitung | 100 | " " | " 100 | Est. 70 | " 55 |
| Taonan[1] | 925 | " " | " 925 | 650 | " 500 |
| **Non-MEC Plants** | | | | | |
| Anshan Steel Works, Anshan | 73,500 | 43,000 | 30,500 | Est. 51,000 | None |
| Manchu Iron Works, Penchihu | 81,000 | 46,000 | 35,000 | " 57,000 | 4,000 |
| Antung Cement Co., Antung | 5,800 | Prob. 5,800 | Prob. None | " 4,000 | Prob. None |
| Manchu Onoda Cement Co., Chuantou | 3,500 | 3,500 | None | " 2,500 | None |
| Manchu Asano Cement Co., Chinhsien | 6,000 | None | 6,000 | " 4,200 | 1,500 |
| Manchu Iwaki Cement Co., Liaoyang | 4,400 | None | 4,400 | " 3,000 | Est. 3,000 |
| Manchu Iwaki Cement Co., Penchihu | 8,000 | 8,000 | None | " 5,600 | None |
| Manchu Iwaki Cement Co., Kungyuan Penchihu | 6,000 | 6,000 | None | " 4,200 | None |
| Army Fuel Depot, Chinhsi | 15,000 | None | 15,000 | " 10,000 | None |
| Synthetic Fuels Co., Chinhsien | 5,000 | None | 5,000 | " 3,500 | 2,500 |
| Mukden Cotton Spinning Co., Mukden | 1,250 | None | 1,250 | " 880 | 1,000 |
| Yingkou Spinning Co., Yingkou | 1,000 | Prob. None | Prob. 1,000 | " 700 | Prob. 600 |
| Mukden Arsenal, Mukden | 10,000 | None | 10,000 | " 7,000 | 3,000 |

---

[1] This plant listed only in MEC records in Tokyo.

[2] Turbine and switchboard removed.

# HEILUNGKIANG PROVINCE

| MEC Plants | Rated Capacities in Kilowatts | | | Practical Operating Capacity Under Normal Conditions | Practical Operating Capacity July 1946 |
|---|---|---|---|---|---|
| | Capacity Aug. 1945 | Capacity Removed | Capacity Remaining | | |
| Chalianoerh | 5,200 | No info. | Prob. 5,200 | 4,400 | Prob. 2,000 |
| Hailaerh | 3,600 | " | " 3,600 | 3,500 | " 3,500 |
| Haokang | 4,900 | " | " 4,900 | 3,700 | " 2,000 |
| Peian | 3,900 | " | " 3,900 | 3,600 | " 3,600 |
| Sunwuold | 2,000 | " | " 2,000 | 2,000 | " 2,000 |
| Sunwunew | 4,500 | " | " 4,500 | 4,500 | " 4,500 |
| Tsitsihar | 8,400 | " | " 8,400 | 7,000 | " 7,000 |
| Aerhshan | 400 | " | " 400 | 200 | " 200 |
| Anta[1] | 170 | " | " 170 | Est. 120 | " 95 |
| Chalantun | 200 | " | " 200 | 200 | " 200 |
| Chaotung | 87 | " | " 87 | 70 | " 70 |
| Hailun | 215 | " | " 215 | 100 | " 100 |
| Heiho[1] | 530 | " | " 530 | Est. 370 | " 290 |
| Mientuho | 200 | " | " 200 | 200 | " 200 |
| Nenchiang | 500 | " | " 500 | 200 | " 200 |
| Noho | 403 | " | " 403 | Est. 280 | " 280 |
| Payen | 200 | " | " 200 | " 140 | " 110 |
| Pokotu | 140 | " | " 140 | 100 | " 100 |
| Tailai | 98 | " | " 98 | 80 | " 80 |
| Tungho | 200 | " | " 200 | 200 | " 200 |

# JEHOL PROVINCE

| MEC Plants | | | | | |
|---|---|---|---|---|---|
| Fouhsin | 160,000 | 160,000<br>plus 105,000[3] | None | 120,000 | None |
| Peipiao | 15,000 | None | 15,000 | 12,000 | Prob. 10,000 |
| Shuangtoushan | 6,000 | Prob. None | Prob. 6,000 | 6,000 | " 3,000 |
| Chihfeng | 500 | " None | " 500 | Est. 350 | Est. 300 |
| Lingyuan | 225 | " None | " 225 | " 160 | " 150 |
| Pingchuan | 400 | " None | " 400 | 200 | Prob. 200 |
| Yuerhyai | 650 | " None | " 650 | Est. 450 | Est. 400 |

---

[1] This plant listed only in MEC records in Tokyo.

[2] Turbine and switchboard removed.

## KIRIN PROVINCE

Rated Capacities in Kilowatts

| MEC Plants | Capacity Aug. 1945 | Capacity Removed | Capacity Remaining | Practical Operating Capacity Under Normal Conditions | Practical Operating Capacity July 1946 |
|---|---|---|---|---|---|
| Changchun | 49,250 | None | 49,250 | 42,000 | None |
| Chiamussu | 22,500 | Poss. 22,500 | Poss. 22,500 | 20,000 | Poss. 20,000 |
| Chiaoho | 10,880 | No info. | Prob. 10,880 | 10,000 | Prob. 9,000 |
| Chienchen | 3,000 | " | " 3,000 | 3,000 | " 3,000 |
| Chingpohu (hydro) | 36,000 | Prob. None | " 36,000 | 36,000 | Poss. 36,000 |
| Chining | 30,000 | Poss. 15,000 | Poss. 15,000 | 27,000 | " 13,500 |
|  |  |  | Prob. 15,000 |  | Prob. 13,500 |
| Harbin | 38,000 | None | 38,000 | 20,000 | None |
| Hunchun | 5,600 | No info. | Prob. 5,600 | 3,000 | Prob. 2,000 |
| Lungching | 11,000 | " | " 11,000 | 9,000 | " 9,000 |
| Mutanchiang | 9,700 | None | 9,700 | 8,000 | 3,750 |
| Suifengho | 1,600 | No info. | Prob. 1,600 | 1,200 | Prob. 1,200 |
| Tafengmen (hydro) | 283,000 | 140,000<br>plus 280,000[4] | 143,000 | 283,000 | 143,000 |
| Titao | 5,880 | No info. | Prob. 5,880 | 5,000 | Prob. 4,500 |
| Tuhsi[1] | 2,700 | " | " 2,700 | Est. 1,900 | " 1,500 |
| Chienkouchi | 800 | " | " 800 | 700 | " 600 |
| Fuchin | 560 | " | " 560 | Est. 400 | Est. 350 |
| Ilan | 600 | " | " 600 | " 420 | " 350 |
| Imienpo | 200 | " | " 200 | 140 | Prob. 200 |
| Nungan | 162 | " | " 162 | 150 | " 100 |
| Sanchaho | 146 | " | " 146 | 140 | " 140 |
| Sunghuachiang | 65 | " | " 65 | 45 | " 35 |
| Tehui | 96 | " | " 96 | 90 | " 90 |
| Wangching | 100 | " | " 100 | 0 | " 0 |
| Wuchang | 176 | " | " 176 | 160 | " 160 |
| Yushu | 30 | " | " 30 | 30 | " 30 |
| **Non-MEC Plants** |  |  |  |  |  |
| Manchu Asano Cement Co., Kirin | 7,000 | 7,000 | None | Est. 5,000 | None |
| Toman Cement Co., Miaoling | 6,000 | Prob. 6,000 | Prob. None | " 4,200 | Prob. None |
| Nickiman Pulp Co., Jihman | 1,000 | No info. | " 1,000 | " 700 | " 700 |
| Manchu Pulp Co., Hailin | 3,000 | Poss. 3,000 | Poss. 3,000 | " 1,200 | Poss. 2,200 |
| Toman Pulp Co., Kaishantung | 1,800 | No info. | Prob. 1,800 | " 1,300 | Prob. 1,000 |
| Manchuria Synthetic Petroleum Co., Kirin | 18,000 | 18,000 | None | " 13,000 | None |
| Oriental Pulp Co., Shihhsien | 2,700 | No info. | Prob. 2,700 | " 2,000 | Est. 2,000 |
| Toyo Pulp Co., Wangching | 2,000 | " | " 2,000 | " 1,500 | Prob. 1,500 |

---

[1] This plant listed only in MEC records in Tokyo.

[4] 280,000 kw of partially installed equipment.

## UNLOCATED

|  | Rated Capacities in Kilowatts |  |  |  |  |
|---|---|---|---|---|---|
| MEC Plants | Capacity Aug. 1945 | Capacity Removed | Capacity Remaining | Practical Operating Capacity Under Normal Conditions | Practical Operating Capacity July 1946 |
| Mushih[1] | 3,000 | No info. | Prob. 3,000 | Est. 2,100 | Est. 1,500 |
| Shentung | 4,300 | " | " 4,300 | 3,800 | Prob. 3,800 |
| Chienkouchi | 320 | " | " 320 | Est. 220 | Est. 180 |
| Chouchangtze | 65 | " | " 65 | " 45 | " 35 |
| TOTALS | 1,786,253 kw | 1,393,300 kw[5] | 777,953 kw | 1,456,260 kw | 429,550 kw |

---

[1] This plant listed only in MEC records in Tokyo.

[4] 280,00 kw of partially installed equipment.

[5] This total includes 385,000 kw of partially installed and replacement equipment which was not included in "Capacity Aug. 1945". See footnotes 3 and 4.

**NOTE:** Those listed as "Possible Removals" or "Possible Remaining" have been included in the totals, except in "Practical Operating Capacity July 1946"

## UNLOCATED

|  | Rated Capacities in Kilowatts |  |  |  |  |
|---|---|---|---|---|---|
| MEC Plants | Capacity Aug. 1945 | Capacity Removed | Capacity Remaining | Practical Operating Capacity Under Normal Conditions | Practical Operating Capacity July 1946 |
| Mushih[1] | 3,000 | No info. | Prob. 3,000 | Est. 2,100 | Est. 1,500 |
| Shentung | 4,300 | " | " 4,300 | 3,800 | Prob. 3,800 |
| Chienkouchi | 320 | " | " 320 | Est. 220 | Est. 180 |
| Chouchangtze | 65 | " | " 65 | " 45 | " 35 |
| TOTALS | 1,786,253 kw | 1,393,300 kw[5] | 777,953 kw | 1,456,260 kw | 429,550 kw |

[1] This plant listed only in MEC records in Tokyo.

[4] 280,00 kw of partially installed equipment.

[5] This total includes 385,000 kw of partially installed and replacement equipment which was not included in "Capacity Aug. 1945". See footnotes 3 and 4.

**NOTE:** Those listed as "Possible Removals" or "Possible Remaining" have been included in the totals, except in "Practical Operating Capacity July 1946"

# CHAPTER IV

## COAL

### A. BACKGROUND.

Manchuria is rich in natural resources and coal is its greatest mineral asset. Historically, coal has been mined in Manchuria for at least 800 years, but the first major impetus was given to coal production with the development by the Russians of the Chinese Eastern Railway during the period of Russian "influence" in Manchuria.

After the Russo-Japanese War, Manchuria was divided into two principal "spheres of influence" with the Russians dominating the north and the Japanese increasingly active in industrial exploitation in the south. With few exceptions the coal fields are distributed over the entire southern portion of Manchuria. Both the Russians and the Japanese, principally thru the aegis of the Chinese Eastern and the South Manchurian Railways respectively, continued the development and exploitation of the coal resources. In this the Japanese were much more active and after the seizure of Manchuria in 1931 and the creation of the puppet state of Manchukuo, the greatest development took place.

Russian influence in Manchuria waned with the revolution of 1917 and reached its low ebb with the sale in 1935 by the Soviet Government of the Russian interest in the Chinese Eastern Railway to Japan, thus leaving Japan a clear field in the entire area.

Japanese Corporate Control:

The South Manchurian Railway Company was organized in 1906 as an aftermath of the Russo-Japanese war. Prior to the Japanese seizure of Manchuria in 1931, the South Manchurian Railway played the dominant role in the development of Manchurian coal mines in the Japanese sphere of influence. The company continued to expand following the Japanese acquisition of Manchuria and branched out into very diverse industrial fields; in fact, they practically became an industrial banking firm.

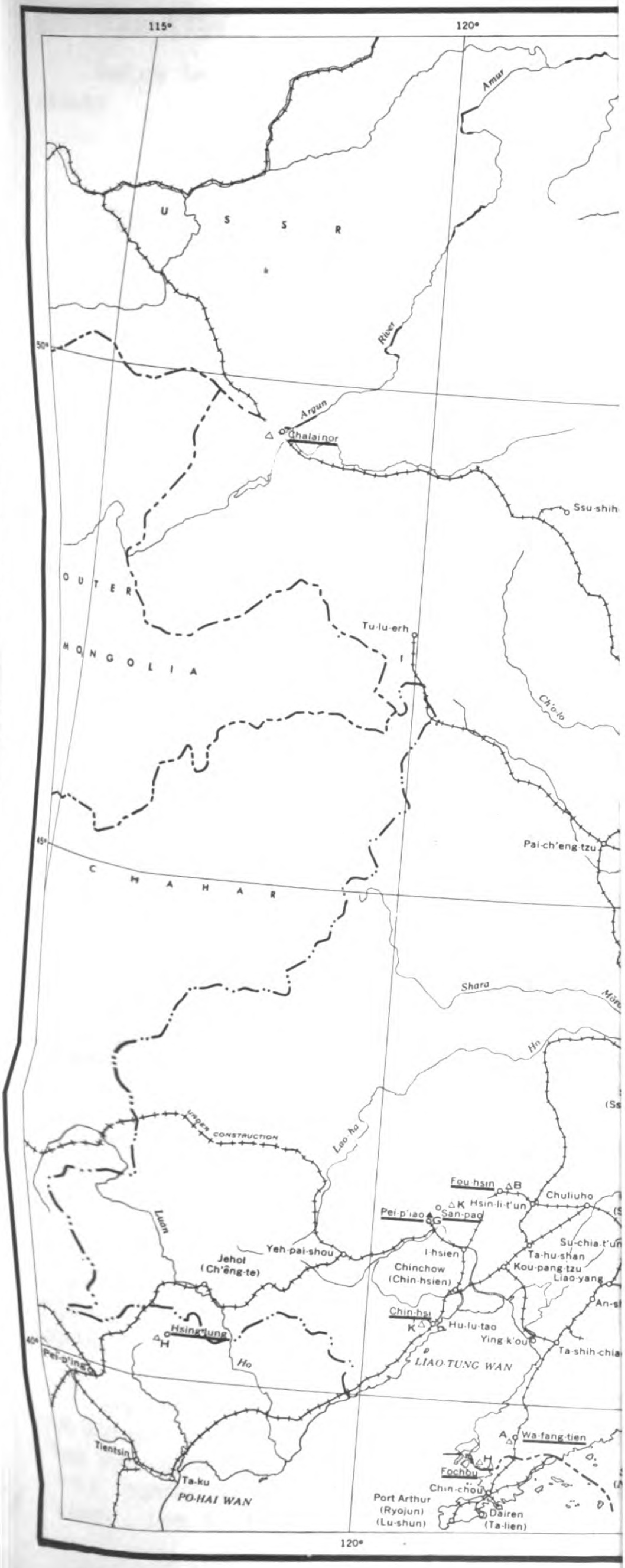
With the exception of those mines controlled by the South Manchurian Railway, all important coal mines in Manchuria were under control of the Manchurian Industrial Development Corporation, known as MANGYO. MANGYO was organized in 1937 by the Nippon Industrial Company Ltd., which had "achieved most outstanding success in Japan by integration of extensively diversified industrial undertakings." Prior to the organization of MANGYO, the Manchurian Colliery Company, Ltd., which had been organized in 1934, played the dominant role in the development of the Manchurian Coal industry.

The Japanese publication Oriental Economist for 1940 gives the following information about the Manchurian Colliery Company, Ltd.:

> "On the basis of the Manchurian Colliery Company Act, Imperial Ordinance No. 12 of 1934, this company was founded as a special corporation under the law of Manchukuo on May 17 of the same year.
>
> "The new company began its business by direct management of the coal mines of Fushun, Pataokow, Sun Chianwan, Weimingshan, Hsinchiu, and also with close affiliations with the mines of Haokang, Peipiao, and Hsian. The modest production of those days was only 1.5 million metric tons a year. Much attention was then given to prospecting of potential sources. In 1935 the development of the Titao district of the Mishan mine was commenced and in August of the same year the colliery of the Chalimar was taken over as a mandate. The year 1936 saw the beginning of mining work at Fouhsin, Hailing, and Penchihu. 1938 work was started at the new mines of Shulan, Tungming, Sanhsing, Chengtzuho, and Pingyang, with the result that an annual output of 5.5 million metric tons has been reached and a further rapid expansion is being indicated. The company has more recently embarked, in conjunction with the 5-year industrial plan of the Manchukuo Government, upon a program for further development, its objective being an annual output of some 18 million metric tons in the year 1941."

When MANGYO took over the Manchuria Colliery Company in 1938, the Manchukuo Government not only guaranteed the capital investment of MANGYO but also a return equivalent to 6 percent per annum on all capital invested. One half of MANGYO's original capaitalization of 450,000,000 yen was subscribed by the Manchukuoan Government.

Accompanying this report is a tabulation, "Manchuria Coal Mines as of 1945" which shows pertinent information concerning the capital structure of the Manchurian coal industry at the close of World War II. This information was obtained from the "Economical Review of the Northeast Provinces of China." (Source File No. 302-Y1-1)


115°
120°
Amur
U S S R
River
Argun
Chalainor
50°
Ssu-shih
OUTER
MONGOLIA
Tu-lu-erh
Ch'o-lo
Pai-ch'eng-tzu
45°
CHAHAR
Shara
Mûr
Ho
(Ss
UNDER CONSTRUCTION
Lao-ha
Fou-hsin
B
K
Hsin-li-t'un
Chuliuho
(S
Pei-p'iao
San-pao
G
Su-chia-t'un
Luan
Yeh-pai-shou
I-hsien
Ta-hu-shan
Jehol
(Ch'êng-te)
Chinchow
(Chin-hsien)
Kou-pang-tzu
Liao-yang
An-sh
Chin-hsi
K
Hu-lu-tao
Hsing-lung
H
Ying-k'ou
Ta-shih-chia
40°
Pei-p'ing
Ho
LIAO-TUNG WAN
A
Wa-fang-tien
Tientsin
H
Fochou
Ta-ku
(M
PO-HAI WAN
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
120°

## B. PRODUCTION

Below is a table showing annual production of Manchurian coal mines:

### PRODUCTION OF COAL IN MANCHURIA 1929-1944

| Year | Production (Metric Tons) | Exports |
|---|---|---|
| 1929a | 9,960,000 | 4,010,000 |
| 1930a | 9,020,000 | 3,830,000 |
| 1931a | 9,540,000 | 4,260,000 |
| 1932a | 8,830,000 | 3,360,000 |
| 1933b | 9,063,000 | 3,738,000 |
| 1934b | 10,338,000 | 4,657,000 |
| 1935b | 12,166,000 | 3,559,000 |
| 1936b | 13,874,000 | 3,845,000 |
| 1937b | 14,410,000 | 3,420,000 |
| 1938d | 15,000,000 | N.A. |
| 1939d | 19,000,000 | N.A. |
| 1940e | 21,200,000 | N.A. |
| 1941e | 23,800,000 | N.A. |
| 1942c | 24,168,670 | 1,931,400 |
| 1943c | 25,320,425 | 2,173,143 |
| 1944c | 25,626,704 | 2,294,005 |

a. Contemporary Manchuria, Vol. 1, p. 71, 1937.
b. Manchuria Year Book, 1941.
c. Economical Review of North Eastern District of China, (prepared in Changchun by former Japanese industrial leaders, June 1946)
d. Consular Report on Manchurian Coal - 1941.
e. Board of Economic Warfare - Publication No. EP 18L, May 15, 1943.
N.A. Information not available.

These figures indicate that the production of coal was nearly trebled during the period from 1932 to 1944. Peak production was in 1944, when over 25,600,000 tons of coal were produced.

It is significant that in spite of this increase of production there was a decrease in exports of nearly 50 percent for the corresponding period, with Korea replacing Japan as the princiapl export outlet. The development of the iron and steel industry in both Korea and Manchuria doubtless was the prime reason for this condition, too, after 1937 Japan acquired additional sources for coal in China proper. Imports into Manchuria came primarily from the Kailan mines in North China.

During World War II approximately 300,000 persons were employed in Manchurian coal mines. Japanese were generally employed for all key positions but they normally comprised only about 5 percent of the total number of employees, the balance being native Chinese and sometimes a few Koreans.

Mining methods varied widely in the various mines visited. These methods are outlined in the more detailed plant inspection reports of the mines which are in Appendix 4. In general, the reported production per man was very low. At Fushun, where about 60,000 men are now employed, the production rate is about one ton of coal per day for each 24 men employed. Of course, this is an exaggerated figure due to the fact that at present the vast majority of these men are being employed because of sociologic and political reasons. There is not enough mining equipment or power left to justify any such number of employees. However, based on employment and production figures furnished for normal conditions, from two to three men are required to produce a ton of coal per day in the Manchurian coal-mining districts.

During World War II, the Japanese produced an average of about 24,000,000 tons of coal annually in Manchuria, most of which was consumed within Manchuria itself. The railways in Manchuria consumed about 6,000,000 tons of coal annually. The harsh Manchurian climate resulted in over 4,000,000 tons of coal per year being consumed for domestic heating by a population of about 40,000,000. Other major consumers of coal were the iron and steel industries, which used about 3,500,000 tons per year; the military used about 2,500,000 tons, the thermalelectric generation industry and the ceramic industry each used about 1,000,000 tons per year. The following table, taken from information contained in the "Economical Survey of Northeast China," shows further details of the industrial consumption of coal in Manchuria for the years of 1942, 1943 and 1944.

## PRODUCTION AND CONSUMPTION OF COAL IN MANCHURIA
(Metric Tons)

| | 1942 | 1943 | 1944 |
|---|---|---|---|
| **PRODUCTION:** | | | |
| Coal | 24,168,670 | 25,320,425 | 25,626,704 |
| Briquette | 387,835 | 417,682 | 191,959 |
| Total— | 24,556,505 | 25,738,107 | 25,818,663 |
| Consumption at Mines | 4,913,188 | 4,593,997 | 4,444,123 |
| Balance— | 19,643,317 | 21,144,110 | 21,374,540 |
| **IMPORT:** | | | |
| North China | 2,540,045 | 2,802,280 | 1,850,163 |
| Korea | 266,685 | 175,076 | 159,326 |
| French Indo-China | 10,000 | 1,860 | |
| Total— | 2,816,730 | 2,979,216 | 2,009,489 |
| *TOTAL (Production & Import) | 22,460,047 | 24,123,326 | 23,384,029 |
| **CONSUMPTION:** | | | |
| Military | 2,541,594 | 2,726,439 | 2,712,522 |
| Heating | 4,470,154 | 4,605,493 | 4,032,901 |
| Railway | 5,677,829 | 6,344,929 | 6,587,344 |
| Iron making | 3,903,313 | 3,935,123 | 3,171,132 |
| Electricity | 1,286,756 | 821,260 | 578,099 |
| Gas | 226,502 | 234,634 | 224,804 |
| Metal Refinement | 68,085 | 61,886 | 59,073 |
| Light Metal | 60,042 | 89,898 | 99,327 |
| Machine | 442,275 | 461,387 | 428,971 |
| Ceramics | 1,286,552 | 1,311,113 | 833,860 |
| Chemical Industry | 616,176 | 525,852 | 615,296 |
| Agricultural and Live-Stock | 285,268 | 272,567 | 181,341 |
| Products Industry | 62,978 | 54,018 | 34,283 |
| Food Stuff | 90,019 | 70,665 | 57,741 |
| Spinning and dyeing | 119,448 | 101,725 | 78,406 |
| Others | | | 546,306 |
| Total— | 21,136,991 | 21,616,989 | 20,241,406 |
| **EXPORT:** | | | |
| Japan | 643,193 | 576,767 | 589,612 |
| Korea | 940,809 | 1,363,612 | 1,567,866 |
| South China | | 4,493 | |
| Bunker | 397,398 | 232,262 | 136,527 |
| Total— | 1,981,400 | 2,177,134 | 2,294,005 |
| *TOTAL (Consumption & Export) | 23,118,391 | 23,794,123 | 22,535,411 |
| *Stock of Coal | (-) 658,344 | (+) 329,203 | (+) 848,618 |

An outline of the geological conditions of the coal mines visited will be found in the Plant Inspection Reports in Appendix 4.

Probably most of the coking coal in the Far East is mined in Manchuria. The coal exported to Japan and Korea was primarily for coking. Generally, Manchurian mines producing coking coal are not far from iron ore deposits. Mines in the Penchihu district produce coking coal. Excellent coking coal is mined at Peipiao. The Lungfeng mine in the Fushun district produces coking coal. Other sources are shown on the accompanying map. The general run of Manchurian coal is bituminous and sub-bituminous which, however, lends itself satisfactorily for various industrial uses. There are limited amounts of coal produced which technically would be called semi-anthracite.

From the figures supplied by former heads of Japanese industry in Manchuria, the total coal reserves of Manchurian coal mining companies amount to 22,883,430,000 metric tons. This figure checks fairly closely with earlier Japanese geological reports that placed Manchurian coal reserves at 20,000,000,000 tons but it is considerably in excess of what heretofore has been accepted by Chinese and American reports.

The Pauley Mission was primarily concerned with the disposition of Japanese assets subject to Allied reparation claims. With limited time available, the Mission relied heavily upon Chinese and Japanese sources of information on geology, production, mining processes, inventories, et cetera.

## C. EFFECTS OF SOVIET OCCUPATION

Inspections by the Pauley Mission covered only six of the Manchurian coal fields, namely, Fushun, Fouhsin, Peipiao, Hsian, Penchihu, and Yentai. Inspections were limited to these fields due to the fact that other areas were not under control of Chinese Nationalist forces. However, from a production standpoint, these mines cover about 50 percent of the normal and probably 80 percent of the present Manchurian production.

ANNUAL PRODUCTION OF MINES INSPECTED BY PAULEY MISSION AS GIVEN IN "ECONOMICAL REVIEW OF NORTHEASTERN DISTRICT OF CHINA" (Metric Tons).

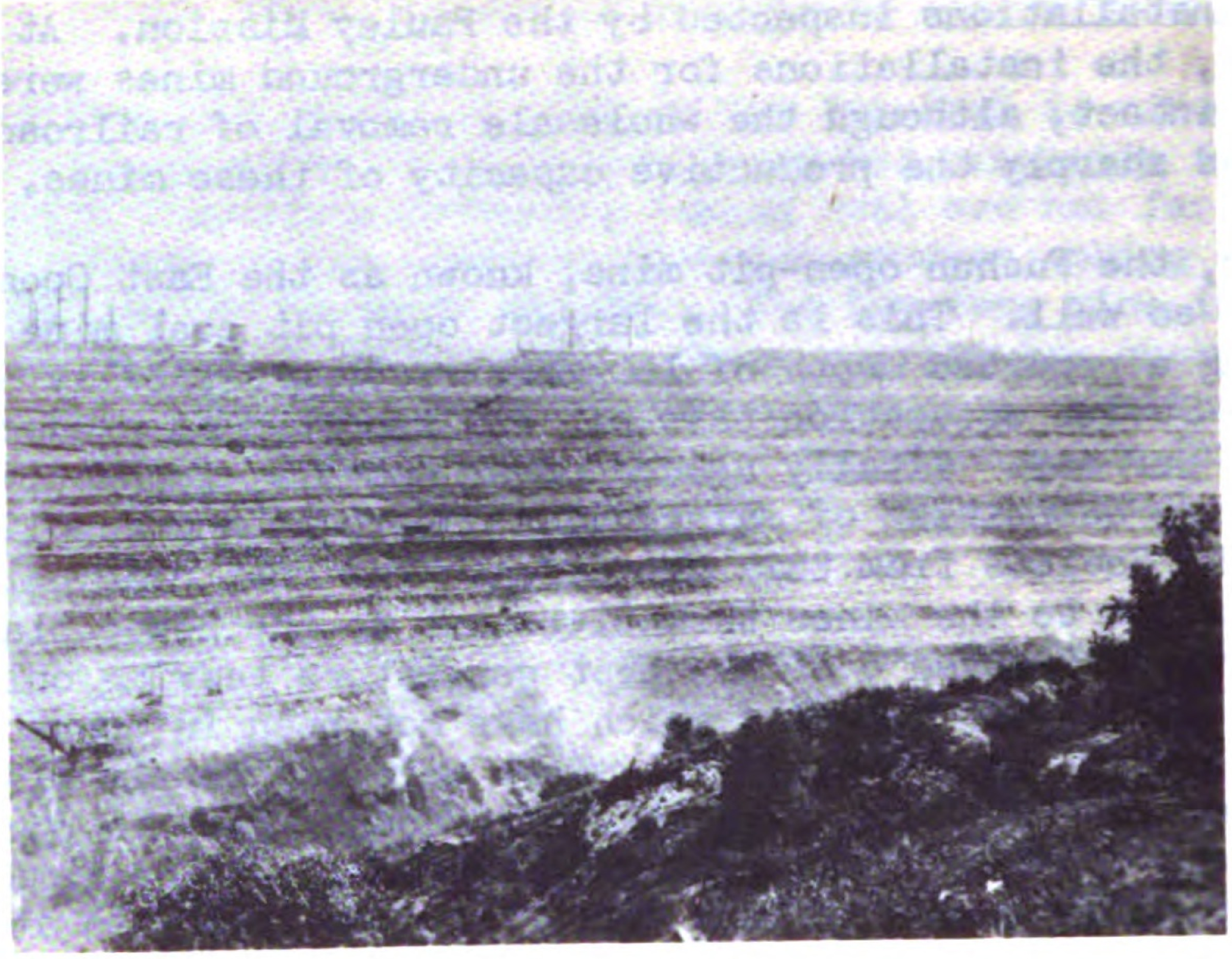
| | Coordinates | | | | |
|---|---|---|---|---|---|
| | Long. | Lat. | 1942 | 1943 | 1944 |
| Fushun | 123:54 | 41:53 | 6,359,000 | 5,374,000 | 4,512,000 |
| Fouhsin | 121:40 | 42:10 | 3,738,000 | 4,039,000 | 4,121,000 |
| Peipiao | 120:47 | 41:47 | 1,092,000 | 1,251,000 | 1,238,000 |
| Hsian | 125:09 | 42:54 | 1,370,000 | 1,810,000 | 2,095,000 |
| Penchihu | 123:43 | 41:20 | 801,000 | 865,000 | 951,000 |
| Yentai | 123:18 | 41:26 | 404,000 | 396,000 | 334,000 |
| TOTALS - | | | 13,764,000 | 13,735,000 | 13,251,000 |

The Soviets displayed no consistent policy in their treatment of the mining installations inspected by the Pauley Mission. At Fushun, for instance, the installations for the underground mines were left practically intact, although the wholesale removal of railroad rolling stock reduces sharply the productive capacity of these mines.

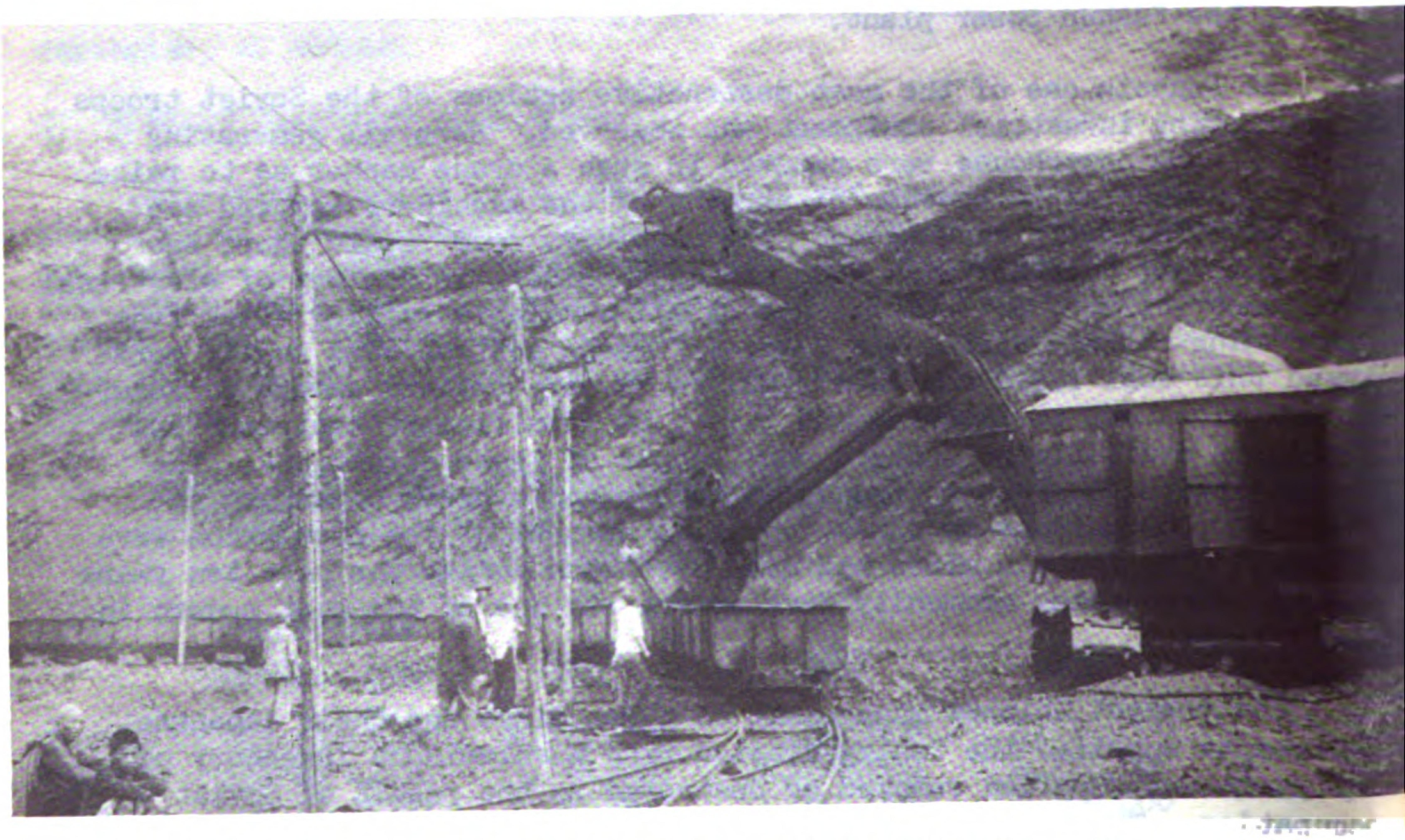
However, the Fushun open-pit mine, known as the East Open Pit, did not fare so well. This is the largest open pit coal mine in the world, having a reported depth of 160 meters, or practically 500 feet. Prior to the Soviet occupation this pit was reported as producing 6,000 tons of coal per day. Vitally needed power shovels, locomotives, mining cars, and large quantities of maintenance materials and supplies were removed by the Soviets from this operation. The most critical damage at Fushun was not to the mines themselves but to the power plant, from which the Soviets removed 6 of the best generators leaving only 4. Of these 4, two are 12,500 kw units which have not been in operation in years and are still inoperable. All mines were completely electrified and these removals left them with scarcely enough power to operate the pumps much less conduct normal mining operations. Of the remaining 2 steam-generating units one is in a deplorable condition and its failure would doubtless result in very serious flooding. The damage to the Fushun mines exceeded by far the value of equipment removed. Further information on the Fushun mines will be found in Plant Inspection Report 1-B-4, in Appendix 4. Plant Inspection Report 1-L-2 in Appendix 3 covers the Fushun power plant.

At Fouhsin one of the most destructive actions of the Soviet troops in stripping industrial equipment was observed. Here all generating units in the powerhouse were removed in such a crude manner as to raise serious doubts as to whether 25 percent of the machinery removed can ever be effectively used again. The machinery from repair shops was also removed, together with much mining machinery in the way of electrical equipment, hoists, and pumps. Nearly all available rolling stock from the mining railway system was removed. These actions have nearly paralyzed this coal field and have resulted in very serious damage to underground mines due to flooding and fires, as insufficient equipment and power are available to contend with either of these conditions. The Soviet actions in Fouhsin reduced a modern and orderly community of about 200,000 persons to chaos. Over 90 percent of the population were Chinese. The Fouhsin mines had been developed during the past ten years and the surrounding community development was one of the most modern in the Orient.

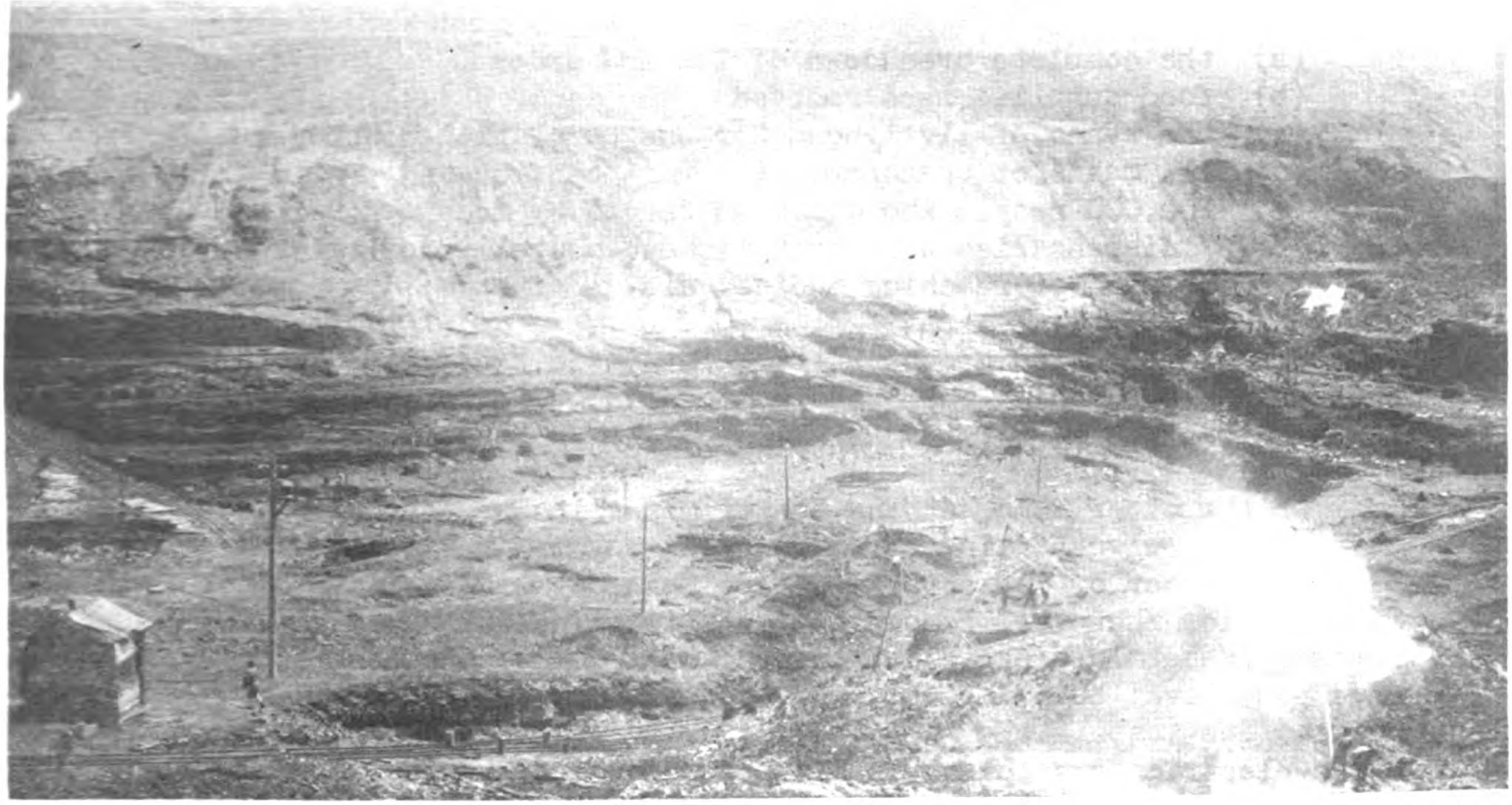
The present Chinese management of these mines and their Japanese assistants supplied the Pauley Mission with a voluminous inventory of equipment and supplies removed or destroyed as the result of Soviet occupation. The total weight of this material was estimated at 51,572 metric tons and includes such items as 15 standard gauge locomotives, 231 standard gauge railway cars, 41 large air compressors, 37 hoisting engines.



Open pit mine at Fushun - The largest open pit coal mine in the world. Only small section shows.

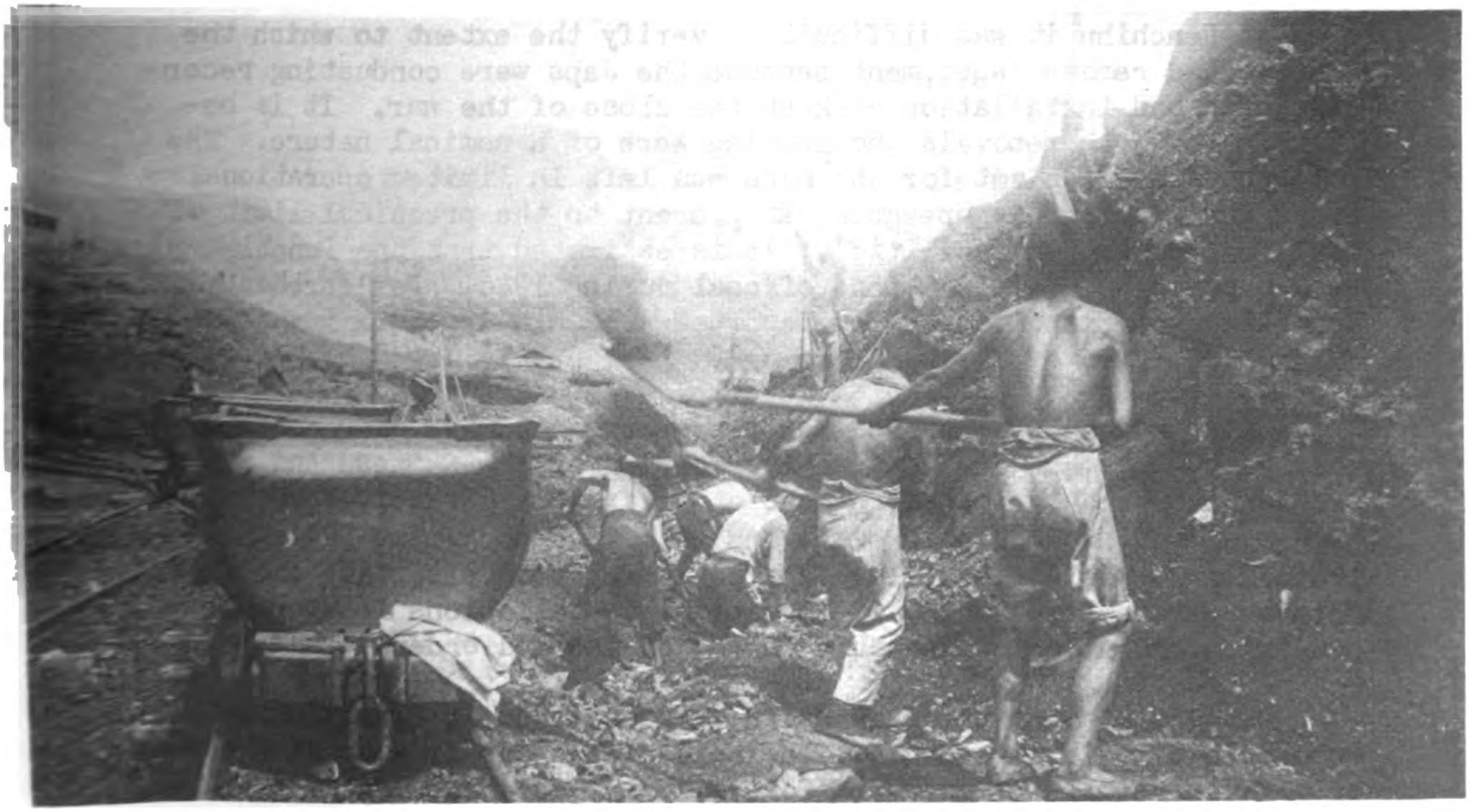


All modern power shovels removed by Soviets leaving only antiquated equipment of the type shown above.



SUNCHIAWAN OPEN PIT MINE - FOUHSIN

2,000,000 tons of coal in sight. Power shovels and standard guage railway cars removed by Soviets. Removal of the power generating equipment has resulted in the flooding of the underground workings.



The hand-mining methods being used at present.

Other results of the Soviet occupation were:

(a) the complete breakdown of law and order
(b) food supplies were removed
(c) the means of livelihood for the population destroyed
(d) all means of transportation were confiscated
(e) 200,000 people who had been served by modern hospitals and dispensaries were left without medical facilities or means of reaching medical aid.

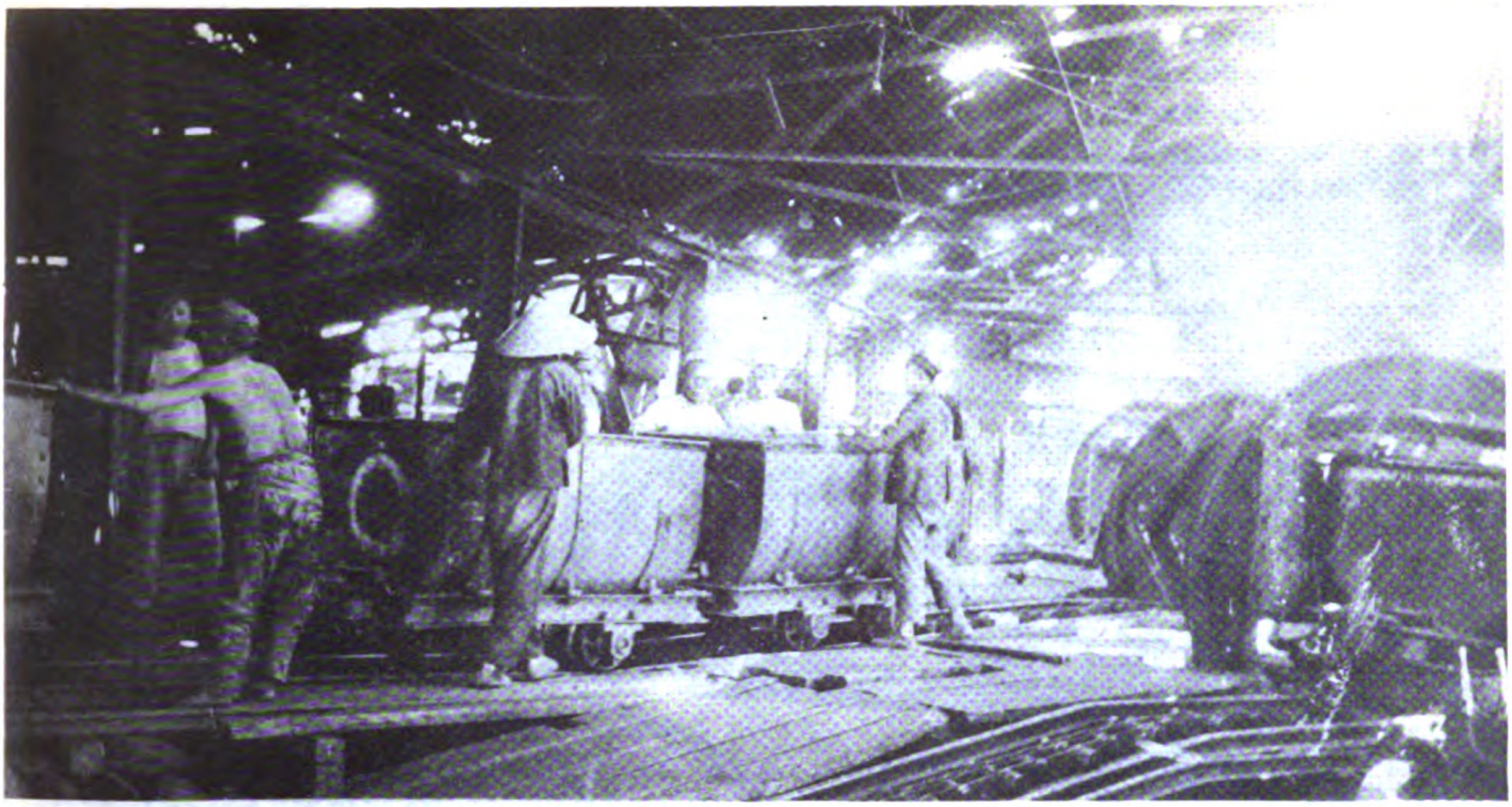
Plant Inspection Report 21-B-1, in Appendix 4, gives further particulars concerning the Fouhsin mines including details of the Power Plant removals.

On the other hand, at the Yentai mines it was reported that the Soviets not only refrained from removing any major equipment but that pillage, either by Soviet soldiers or Chinese, was negligible. The Soviets did, however, remove all supplies, including medical facilities. These mines are not producing coal due to the lack of power. Were power available, about 1,000 tons of coal per day could be produced. The most likely source of power for these mines is from the hydro-electric power plant at Kirin. Chinese Communists control the power line between Kirin and Penchihu. Should the efforts to settle the differences between the contending armies be successful, or should either force gain complete control, power would probably be available. However, it is not likely that the Yentai mines will contribute any significant amount to Manchuria's coal production for the year 1946. For further information concerning the Yentai mines see Plant Inspection Report No. 2-B-2, in Appendix 4.

At Penchihu it was difficult to verify the extent to which the Soviets had removed equipment because the Japs were conducting reconstruction and installation work at the close of the war. It is believed that both removals and looting were of a nominal nature. The antiquated power plant for the mine was left in limited operational order and the mine is operating at present to the practical limit of coal transportation facilities. It is estimated that the Penchihu mine will produce about 75,000 tons of coal during 1946. For further information see Plant Inspection Report 2-A-12, in Appendix 5 and Source File 303-B-3.

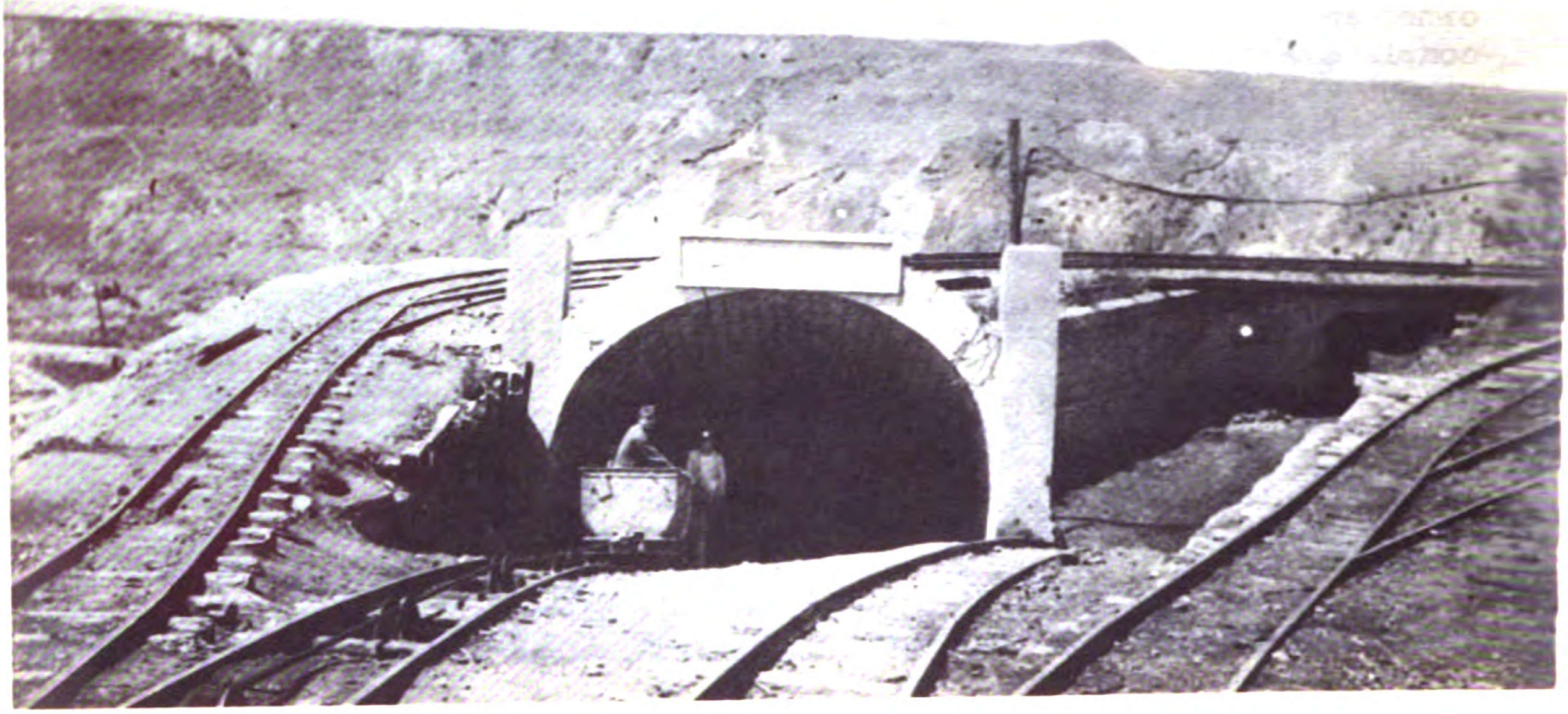
At Hsian the Soviet troops were reported to have made nominal removals of equipment and destructive looting by the Chinese and others was far less than reported in most other areas. Conditions at the Yentai, Penchihu and Hsian mines indicate that where the Soviets refrained from wholesale pillage and equipment removals, that the local Chinese were able to maintain industrial installations in operable condition and also a reasonable degree of law and order.

Details of conditions at Hsian will be found in Plant Inspection Report 28-B-1, in Appendix 4. The coal fields supply some of the most satisfactory coal in Manchuria for railway locomotive use.

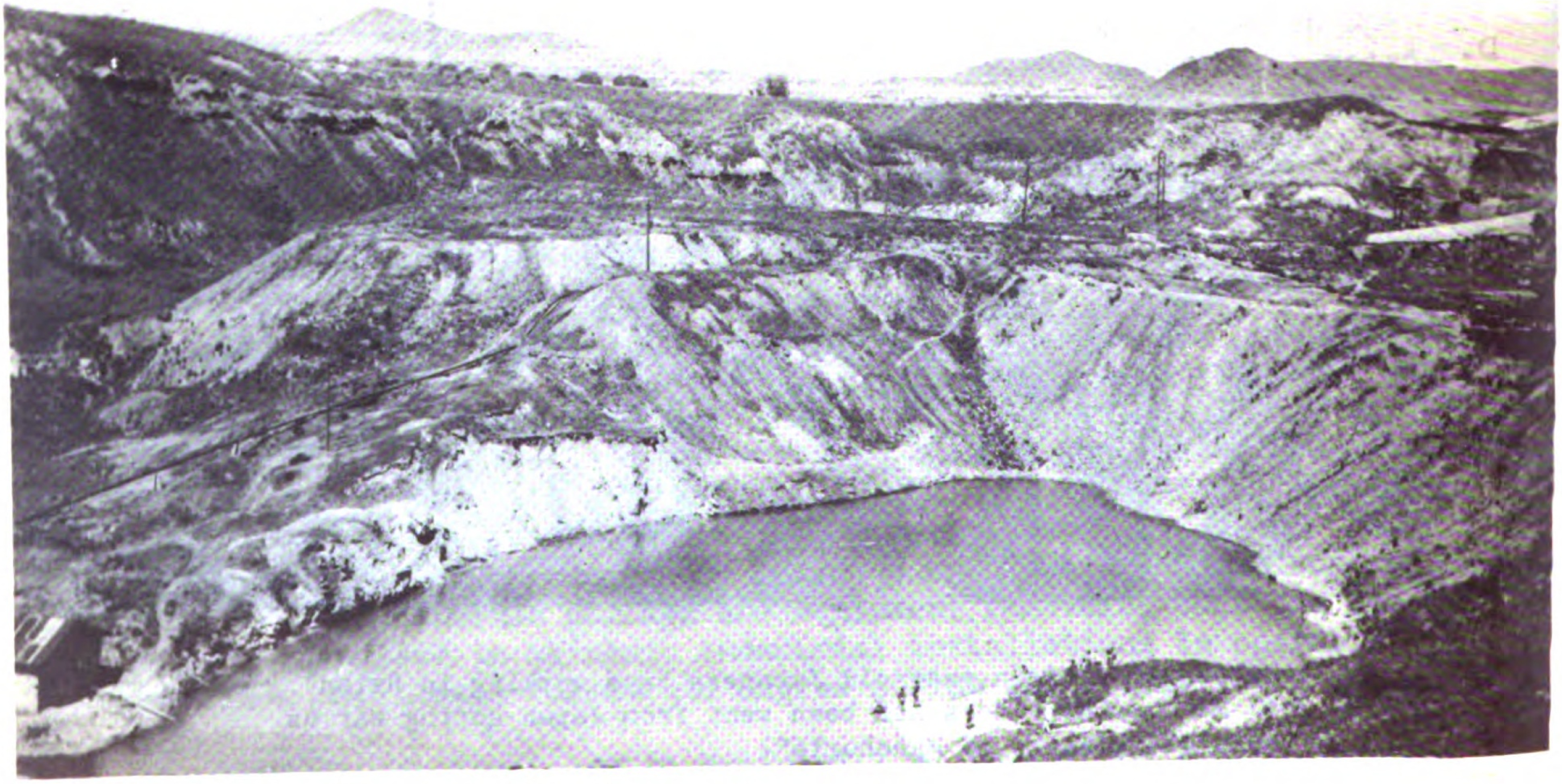


HSIAN COAL MINE - Soviets made only nominal removals and Chinese have been able to maintain most equipment in operable condition.

Fourteen to sixteen year old Japanese boys working in Hsian Coal Mine. These boys had been sent from Japan during war as "Youthful Pioneers of Manchuria".



HSIAN COAL MINES - Mouth of one of the inclines



Abandoned open pit mine at Hsian

At Peipiao, the Soviet troops removed very little in the way of industrial installations although it was reported that they moved large stores of supplies and foodstuffs. They were also reported as being very ruthless in pillaging the Japanese and all Chinese who owned anything of value. They left the community with law and order completely shattered. For further details, refer to Plant Inspection report 22-B-1, in Appendix 4. In the chaos accompanying the Soviet occupation at Peipiao considerable malicious damage was done by Chinese looters. An itemized list of damages and removals due to Soviet occupation of the Fushun, Fouhsin, Yentai and Peipiao mines will be found in Source File 202-B-1.

The Chinese Communist Army attacked the Peipiao mine on May 15, 1946, and partially blew up the powerhouse, and also destroyed railroad bridges and did extensive looting generally. The damage to the powerhouse seriously threatened the mines with flooding and reduced production of coal to a maximum of about 250 tons per day. Three days after inspection by the Pauley Mission these mines were again attacked by the Chinese Communist Army and significant and perhaps permanent damage was done to one of the mines and to railway bridges and installations. It is very difficult to explain the reasons for these destructive attacks by the Chinese Communists. Their aim would appear to be the permanent destruction of a valuable Chinese asset.
Nationalist

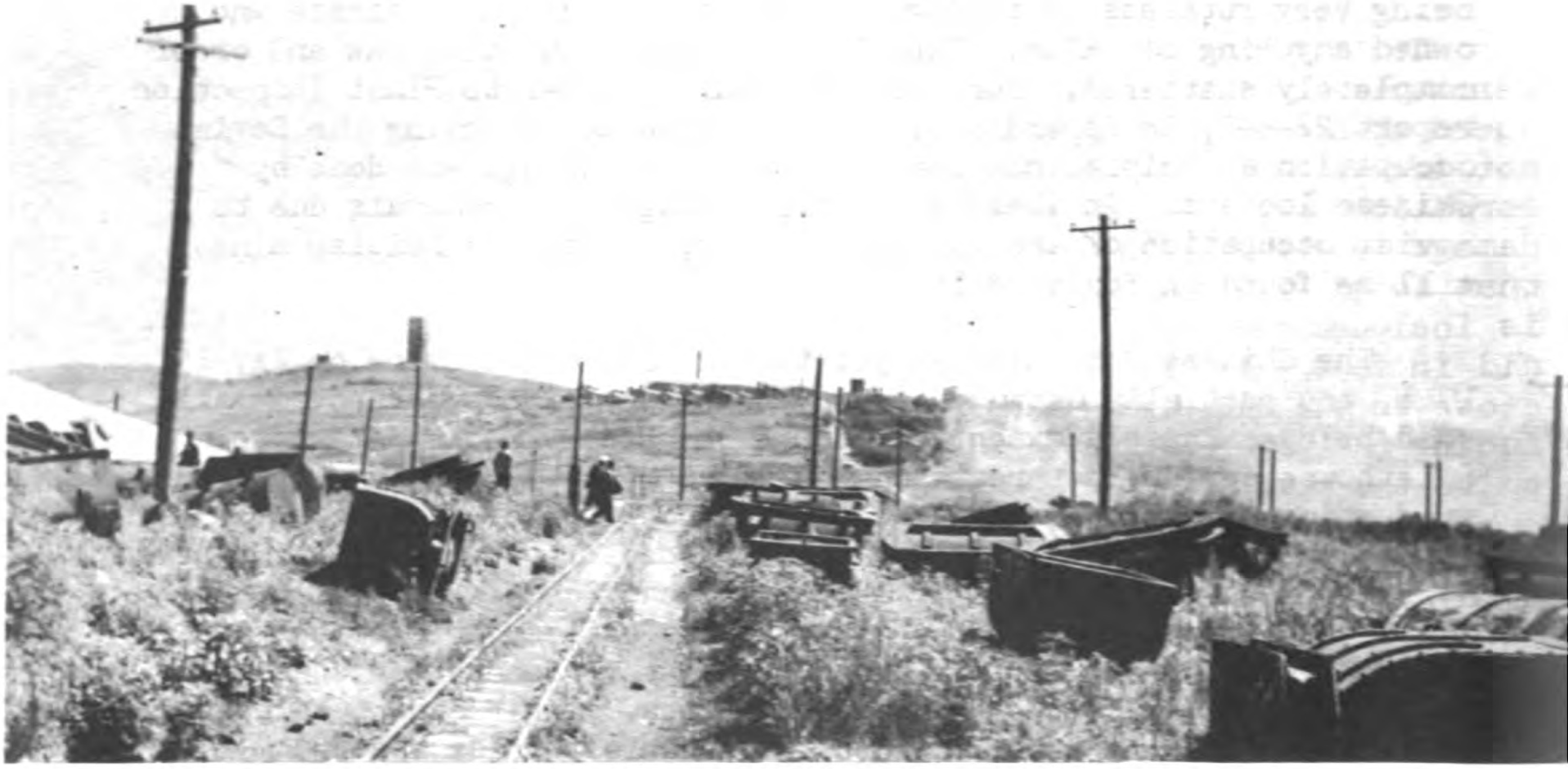
The net effect of Soviet removals and the breakdown of law and order during Soviet occupation was to reduce Manchurian coal production to about 10 percent of its wartime level and to less than 25 percent of what is urgently needed at present to prevent suffering for the people in Manchuria, particularly during the long winter ahead.

## D. ESTIMATE OF DAMAGE

The damage resulting from the Soviet occupation at the mines visited by the Pauley Mission is shown below:

| | | |
|---|---|---|
| Fouhsin | $34,000,000 | |
| Fushun | 10,000,000 | |
| Peipiao | 5,000,000 | |
| Hsian | 500,000 | |
| Penchihu | 50,000 | |
| Yentai | 50,000 | |
| | $49,600,000 | or $50,000,000 |

An independent estimate of damage to the Fouhsin Coal Mine will be found in a letter from Pierce Management, engineering consultants and mine managers who inspected the mines at Peipiao and Fouhsin at the request of the Chinese Government. Their letter is shown with Plant Inspection Report 21-B-1 in Appendix 4. The Pierce estimate of damage based upon removals at Fouhsin is $66,000,000. This includes the power plant which the Pauley Mission estimated at $18,400,000



Mine cars stripped for ball and roller bearings, a condition observed at all mines visited.

The central mine at Peipiao. Soviet damage here consisted primarily of removal of supplies and stocks.

($115 per KW x 16,000 KW) and included in the power estimates, thus leaving a net Pierce estimate of $47,600,000 compared with the Pauley Mission estimate of $34,000,000.

The six mines listed above provided approximately one half of Manchurian coal during the war years. The remaining half was produced by mines in areas now controlled by Chinese Communists and were not accessible to the Pauley Mission. Hence there is very little information on their present status. While there may have been extensive damage to the mines not visited, damage which may equal or even exceed that found at the mines visited, no estimate of damage for these mines is included in this report. It is quite likely that some removals did in fact take place. Many of the mines not visited are situated close to the Siberian and North Korean borders and if they are producing coal, the product could easily go to the Chinese Communists or to the Soviets.

## E. ESTIMATED PRODUCTION FOR 1946

The following is an estimate of the production of coal in Manchuria for the year 1946, from the "Economical Review of Northeast China," Source File 302-Y.1-1:

| | (Metric Tons) |
|---|---|
| Fushun | 900,000 |
| Fouhsin | 500,000 |
| Peipiao | 100,000 |
| Hsian | 400,000 |
| Yentai | 75,000 |
| Sub-Total | 1,975,000 |
| Other Manchurian mines | 500,000 |
| TOTAL | 2,475,000 |

The estimated minimum needs of coal under present conditions in Manchuria is 10,000,000 metric tons per year.

Chinese officials are making desperate efforts to maintain or even increase the present coal production, but their efforts are necessarily marked by cannibalization of equipment and makeshift improvisations which, unless substantial additions to supplies and equipment are promptly available, will result in further deterioration of mine equipment and production.

# CHAPTER V

# IRON AND STEEL

## A. GENERAL

Manchuria's iron industry is confined to three localities--Penchihu and Anshan in Liaoning Province, and Tung-pien-tao in Tung-hua Province. Penchihu and Anshan are the two most important in the production of pig iron, and Anshan is the sole producer of steel. All three districts have their own sources of iron ore which has been mined to supply their respective plants. Coking coal is produced in the Tung-pien-tao and Penchihu areas but Anshan is dependent upon Penchihu, Peipiao and other areas for its coal supply. The accompanying map shows the location of the iron-producing districts and iron and steel plants.

## B. HISTORY AND OWNERSHIP

### 1. Penchihu

The Manchurian iron and steel industry commenced with the founding of the Penchihu Iron Works in 1910 as a Sino-Japanese joint undertaking. The coal mine at Penchihu had previously been acquired by the Okura Company (of Japanese ownership) and operations had started in 1905. In 1911 the iron works was renamed the Penchihu Iron Manufacturing Company, was capitalized at four million dollars (silver) and the Penchihu furnaces which are still in existence were constructed.

In 1914 the first expansion was undertaken following an increase in capital to seven million dollars (silver). Prior to September 1935 and presumably following the Japanese occupation of Manchuria, the Chinese interest was purchased by the Okura Company. In September 1935 the company was reorganized with a capital of ten million yen, subscribed equally by the Okura Company and the Manchukuo Government. Thereafter, a steady expansion both in facilities and investment followed. In 1939 the Manchuria Industrial Development Company, also called MANGYO, which was reorganized in 1937 for the purpose of integrating the heavy industries, took over direction of the enterprise, following a capital expansion to 100 million yen which was subscribed 20 million yen by the Manchukuo Government, 40 million yen by the Okura Company and 40 million yen by the Manchuria Industrial Development Company.

The physical expansion of the Penchihu iron industry followed the entry of MANGYO. A large site was acquired across the river from Penchihu at the village of Kungyuan. At the close of the war this expansion was only partially completed, but there were finished and in operation two 600-ton blast furnaces, a large coke and byproduct plant, sintering and briquetting plant, and other allied units. A large housing development had been constructed along modern lines, a thermal power plant and cement plant had been built and plans had been completed for the construction of four more blast furnaces, an open-hearth steel plant and three rolling mills. The coke capacity was to have been doubled and the byproduct capacity increased and expanded in recoverable products.

In 1944 the entire iron and steel producing industry for all Manchukuo was placed under the Manchurian Iron and Steel Company, Ltd., which controlled not only the Penchihu-Kungyuan project, but also Anshan and Tung-pien-tao. It was capitalized for 740,000,000 Manchukuo yuan, the main shareholders being the Manchukuo Government with 40,000,000 yuan, MANGYO 655,000,000 yuan, and the South Manchurian Railway Company 45,000,000 yuan. Under the terms of the Railway Agreement included with the Sino Soviet Treaty of 14 August 1945, creating the jointly owned Chinese Changchun Railway, properties acquired by the South Manchurian Railway after 1905 (end of Russian Administration) revert to Chinese exclusive ownership. Therefore, the new Chinese Changchun should have no claim on this property based on the fractional interest of the South Manchurian Railway. Our English translation of the Treaty and Railway Agreement will be found in Appendix 2 d.

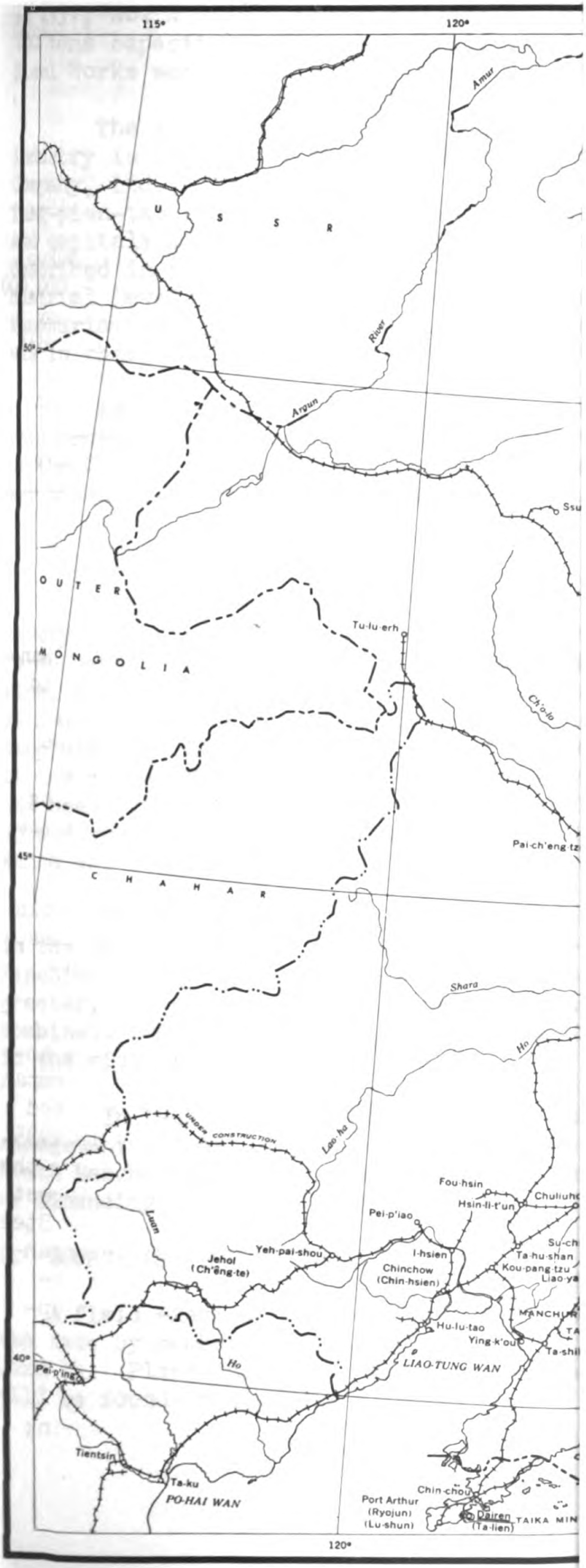
## 2. Anshan

The Anshan development was initially a project of the South Manchurian Railway Company. Discovery of the ore deposits is credited to the geological staff of the railroad and, according to the Japanese, was made in 1909. In late 1916, in accordance with the Sino-Japanese treaty of 1915, a partnership company, named the Shinko Mugen Koshi (Chen Hsing Wu Hsien Kung Ssu) was organized for the purpose of mining iron ore and the South Manchurian Railway Company was authorized in the same year to undertake iron manufacture.

In April 1919, the first blast furnace of the Anshan Iron Works was blown in. In June 1922 a patent covering the ore-dressing process, used for the concentration of low-grade ores, was taken out and construction of the concentration plant was completed in 1924.

Until 1933 Anshan produced only pig iron. In that year the Anshan Iron Works was transferred from the South Manchurian Railway Company to the Showa Steel Works, Ltd., and the manufacture of steel commenced with the building and completion of the No. 1 open-hearth plant in 1935. The entire industry, from mining to finished steel, was placed under the management of the Showa Steel Works and presumably the Chinese interest in the iron mines was acquired through purchase. In 1936 the Showa Steel Works, which had been incorporated under the law of Japan, was reorganized as a Manchukuan corporation, and in March 1938 became one of the principal parts of the newly reorganized Manchuria Industrial Development Company.

Until 1930 there were two blast furnaces with a total daily capacity of 800 tons. In 1930, No. 3, a 550-ton furnace was blown in;


115°
120°
Amur
U S S R
River
Argun
50°
Ssu
O U T E R
M O N G O L I A
Tu-lu-erh
Ch'o-lo
Pai-ch'eng-tz
45°
C H A H A R
Shara
Ho
UNDER CONSTRUCTION
Lao-ha
Fou-hsin
Chuliuh
Hsin-li-t'un
Pei-p'iao
Su-ch
Ta-hu-shan
Yeh-pai-shou
I-hsien
Kou-pang-tzu
Liao-ya
Jehol
(Ch'êng-te)
Chinchow
(Chin-hsien)
Luan
MANCHUR
Hu-lu-tao
Ying-k'ou
TA
Ta-shi
LIAO-TUNG WAN
40°
Pei-p'ing
Ho
Tientsin
Ta-ku
PO-HAI WAN
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
TAIKA MIN
120°

in 1937, No. 4 of 600 tons capacity; in 1938, Nos. 5, 6, 7 and 8, of 700 tons capacity each; and in 1943, No. 9 of 700 tons. The No. 2 Steel Works was built in 1940 under the direction of MANGYO.

The reorganization of the entire Manchurian iron and steel industry in 1944 under the management of the Manchurian Iron and Steel Company, Ltd., placed the Anshan industry as well as the Penchihu and Tung-pien-tao projects under control of this company. The ownership and capitalization of the Manchurian Iron and Steel Company, Ltd. were described in a previous paragraph as consisting of the Manchuria Industrial Development Company, the Manchukuo Government and the South Manchurian Railway Company. Until the close of the war this company was in charge of the industry.

As in Penchihu, the South Manchurian Railway's interest in this property was acquired after 1905 and therefore under the terms of the Sino-Soviet Railway Agreement, the new Chinese Changchun Railway has no legal claim to the Anshan properties.

### 3. Tung-pien-tao

The Tung-pien-tao iron district is a relatively recent discovery. Its initial development followed the organization of the Tohendo Development Company, Ltd., in September 1938 as one of the principal subsidiaries of the Manchuria Industrial Development Company. Although a very ambitious program had been worked out, which contemplated the ultimate production of 500,000 MT of pig iron per year, at the close of the war only two experimental 20-ton blast furnaces had been built. Two very important mines had, however, been opened up and by 1943 a production of 900,000 tons had been reached, most of which was shipped to Anshan.

The Japanese regarded the area as one of the most important in the Japanese empire. The ore is richer than at either Anshan or Penchihu and the reserves of ore running better than 50 percent iron are greater, according to their estimates, than at Anshan and Penchihu combined. Good coking coal, fire clay and limestone also are found in the vicinity.

In 1944 the Manchurian Iron and Steel Company, Ltd. assumed management of the project as they had done at Penchihu and Anshan. The South Manchurian Railway Company was not involved in the organization or financing of the project in any way.

## C. SOURCE OF INFORMATION

A field examination of all the facilities at Penchihu and Anshan was made by members of the Pauley Mission in the period June 9 to June 14. Plant inspection reports covering the installations examined will be found in Appendix 5.

With the exception of one mine approximately 30 kilometers northeast of Anshan, no iron mines were visited, as they were in territory controlled at that time by the Chinese Communists and Permission to visit them was not granted by the Chinese Communist authorities. This was also true of the Tung-pien-tao area.

During the visit to Penchihu and Anshan, the Mission was accompanied by Mr. W. C. Sun, Mr. Shao Yi-Chow, Mr. Shao Hsing-Hwa, Mr. C. C. King and other members of the Northeast Section, Ministry of Economic Affairs, Chinese Nationalist Government. Some statistical and technical information was obtained from this group. The most detailed and reliable information, however, was obtained directly from a former Japanese director of the Manchurian Iron and Steel Company properties at Penchihu and Anshan and his staffs. The lack of equipment and destruction were personally observed by members of the Mission and conclusions reached regarding it are considered accurate. Processes were also a matter of observation. Plant capacity statistics could be verified by the size of the equipment, and capacity figures herein quoted are considered accurate.

Past production records and historical data were obtained both from the Japanese plant managers and from officials of the Manchuria Industrial Development Company at Changchun. There were a few discrepancies noted but they were minor in nature. The figures, as given herein, are considered to be reliable.

Inventories of equipment removed were obtained through Japanese officials who were present at the time. Inasmuch as they correspond reasonably with items observed to be lacking and which would have had to be on hand to maintain the scale of previous operations, they have been accepted as substantially correct and are listed in this report.

## D. SUMMARY

### 1. Iron Ore

(a) Total estimated reserves at end of 1944:

| | |
|---|---|
| Ore of 60% to 65% Fe - | 9,810,000 MT |
| Ore of 40% to 60% Fe - | 165,330,000 MT |
| Ore of 30% to 40% Fe - | 3,628,620,000 MT |

(b) Total capacity for mining iron ore prior to August 1945:

| | |
|---|---|
| Ore over 40% Fe - | 3,145,000 MT/yr |
| Ore less than 40% Fe - | 5,500,000 MT/yr |

(c) Production in MT/yr:

| | Over 40% Fe | Less than 40% Fe |
|---|---|---|
| 1942 | 2,174,581 | 2,238,725 |
| 1943 | 2,590,534 | 2,817,477 |
| 1944 | 2,321,187 | 1,436,839 |

(d) Capacity loss due to removals by USSR:

Unknown, but considered high. All iron mines are in the possession of the Chinese Communist army. Members of the Northeastern Economic Commission of the Chinese Nationalist Government state that the mines have been stripped of essential machinery by Soviet troops, and removal inventories submitted by Japanese officials support this conclusion. One mine, northeast of Anshan, known locally as the Cherry Blossom mine, was visited by members of the Mission. It was found to have been completely stripped of all surface equipment and the buildings destroyed.

(e) Present production capacity:

Unknown.

2. Ore Concentration Facilities

(a) Capacity as of August 15, 1945: 2,030,000 MT/yr

(b) Peak production: 2,800,000 MT

(c) Capacity loss due to removals by USSR: 100 percent

(d) Nature of removals:

Concentration equipment for Penchihu mines is located at the mines, which are now in the possession of the Chinese Communists. This equipment has been reliably reported as removed. Concentration equipment for the Anshan mines was located at the iron works at Anshan. Practically all of this equipment was removed by the Soviets.

(e) Present production capacity:

Unless reports covering the concentration equipment at Penchihu are in error, capacity to concentrate iron ore is zero. Immediate revival of pig-iron production will have to depend exclusively on processing rich ore capable of charging directly to the blast furnaces.

3. Coke Making Facilities

(a) Capacity as of August 15, 1945: 2,800,000 MT/yr

(b) Peak production: 2,222,000 MT

(c) Capacity loss due to Soviet removals: 2,016,000 MT/yr (72%)

(d) **Nature of removals:**

The ovens themselves were for the most part left intact. Removals consisted of fittings and servicing equipment, such as pushers, door-lifters, quench cars, valves, motors and other parts essential to the operation of the ovens, and the essential parts of the byproduct recovery equipment. The ovens could be saved only if put in operation or otherwise protected from moisture and freezing. Since this can not be done before the coming winter, the ovens themselves can be considered as lost.

(e) Present productive capacity: approximately 784,000 MT/yr

4. Pig Iron

(a) Capacity as of August 15, 1945: 2,524,000 MT/yr

(b) Production:

1942 - 1,340,808 MT
1943 - 1,710,267 MT
1944 - 1,159,400 MT

(c) Capacity loss due to Soviet removals: 1,786,000 MT/yr (71%)

(d) Capacity loss due to destruction by 8th Route Army (Chinese Communists): 342,000 MT/yr (14%)

(e) Nature of removals and destruction:

There were in the Penchihu area two 200-ton blast furnaces and two 600-ton blast furnaces. The former are old and were not disturbed by the Soviets or Chinese Communists. The two 600-ton furnaces were relatively new, having been blown in in 1941 and 1942; and all essential equipment, such as hoists, turbo-blowers, mud gun, gas washers, hot stove valves, motors, conveyors and rolling stock, as well as the briquetting machines and sintering pans, were removed by the Soviets, thus leaving the furnaces incapable of operation. At Anshan there were two 400-ton, one 550-ton, one 600-ton and five 700-ton furnaces. Essential equipment from all but three was removed by the Soviets. In May 1946, the 8th Route Army recaptured Anshan and destroyed the three remaining furnaces by blasting with dynamite.

(f) Present productive capacity:

Assuming the availability of iron ore and coke, approximately 396,000 MT per year of pig iron could be produced. This would mean the continuous operation of the two 200-ton furnaces at Penchihu and placing in operation one 700-ton furnace at Anshan. This furnace was under repair at the time of the Soviet occupation, was not seriously stripped and could be made operable in three months' time by "cannibalizing" parts and turbo-blowers from other furnaces. There existed two 20-ton furnaces at Tungpientao on which no information is available. They are in Chinese-Communist-occupied territory and may or may not be capable of operation.

5. Sponge Iron

(a) Capacity as of August 15, 1945: 112,550 MT/yr

(b) Recent peak production: 27,000 MT (1943)

(c) Capacity loss due to removals by USSR: 110,550 MT/yr (98%)

(d) Nature of removals:

Three sponge-iron plants existed at the time of Soviet occupation, one at the Manchurian Iron and Steel Works at Penchihu of 2000 MT/yr capacity, one at the Manchurian Iron and Steel Works at Anshan of 87,550 MT/yr capacity, and one at Fushun of 23,000 MT/yr capacity. No removals occurred at the small plant at Penchihu, but practically all the essential equipment was removed at Anshan and Fushun. At the latter plant even the rotary kilns were cut into sections and removed.

(e) Present production capacity: 2,000 MT/yr

6. Steel Ingots

(a) Capacity as of August 15, 1945: 1,330,000 MT/yr

(b) Production:

1942 - 737,955 MT
1943 - 843,035 MT
1944 - 439,000 MT

(c) Capacity loss due to removals by USSR: 750,000 MT/yr (57%)

(d) Nature of removals:

There were at Anshan two open-hearth steel plants, one old and one new. The old plant, with an ingot capacity of 580,000 tons per year, was not disturbed and is operable. The new plant, with a capacity of 750,000 tons per year, was stripped of two 660-ton mixers, tilting mechanism.

for six 150-ton open-hearths, four charging machines, all charging and ladle cranes, ingot tilters and converyors and other essential equipment. It would require major re-equipping to place the plant in operation.

(e) Present production capacity:

Assuming the availability of iron ore, pig iron and fuel, there remains a furnace capacity for the making of 580,000 tons of steel ingots per year.

7. Semi-finished Steel (blooms, billets, and slabs)

(a) Capacity as of August 15, 1945: 1,000,000 MT/yr

(b) Production:

1942 - 509,104 MT
1943 - 774,000 MT (?)
1944 - 396,254 MT

(c) Capacity loss due to removals by USSR: 500,000 MT/yr (50%)

(d) Nature of removals:

The blooming mill and small bar mill from No. 1 Steel Plant at Anshan, with a rated capacity of 500,000 MT per year, were not removed. All of the mechanical and electrical equipment of No. 2 blooming mill and its attendant billet mill in No. 2 steel plant (the newer plant) was removed by the Soviets.

(e) Present productive capacity: 500,000 MT/yr

8. Finished Steel (shapes and plates)

(a) Capacity as of August 15, 1945: 910,000 MT/yr

(b) Production:

1942 - 457,833 MT
1943 - 485,693 MT
1944 - 282,000 MT

(c) Capacity loss due to removals by USSR: 586,200 MT/yr (64%)

(d) Nature of removals:

The loss in capacity for the most part is due to removals of rolling mills and associated equipment. The remaining mill capacity at the Manchuria Iron and Steel Company, Ltd. at Anshan is a small bar mill and at the Anshan Steel Fabrication Company a somewhat larger bar mill, neither of which are capable of rolling large sections. Removals have left Manchuria without rolling mill facilities for the production of structural steel shapes and large rails, items which are in particular demand in China.

(e) Present productive capacity:

Assuming the availability of power, rolling capacity for small size shapes and plates is 324,000 tons per year.

### 9. Special Steels

(a) Capacity as of August 15, 1945:

| | |
|---|---|
| Steel | 71,920 MT/yr |
| Forgings | 6,400 MT/yr |
| Rolled Steel - | 26,500 MT/yr |

(b) Production:

| | 1942 | 1943 | 1944 |
|---|---|---|---|
| | (in metric tons) | | |
| Steel | - | - | 30,200 |
| Forging | - | - | 1,116 |
| Rolling | 8,340 | 8,482 | 12,700 |

(c) Capacity loss due to removals by USSR:

| | | |
|---|---|---|
| Steel | - 36,000 MT/yr | (50%) |
| Forging | 6,400 MT/yr | (100%) |
| Rolling - | - | (50%) |

(d) Nature of removals:

Half the furnace capacity and practically all of the forging facilities at Fushun and Kungyuan were removed. The Mission was not permitted by the Soviets to visit Dairen but a similar pattern there is assumed.

## E. IRON ORE AND MINING

The estimate of discovered ore reserves and extent of mine development at the close of the war are indicated in the adjoining tabulation entitled "Manchurian Iron Ore Production, Productive Capacity, and Reserves". Details on the nature of the ore and problems involved in beneficiation are discussed in the individual plant inspection reports in Appendix 5.

## MANCHURIAN IRON ORE PRODUCTION, PRODUCTIVE CAPACITY AND RESERVES

| Name of Company | Number of Employees* | Production 1942 | Production 1943 | Production 1944 | Capacity (MT/yr) | Reserves (1,000 MT) | Iron Content % |
|---|---|---|---|---|---|---|---|
| | | (metric tons) | | | | | |
| ANSHAN: | | | | | | | |
| Rich Ore | | | | | | | |
| Kungchangling | | 905,768 | 924,126 | 877,907 | 1,200,000 | 46,610 | 48-62 |
| Yingtaoyuan | | 203,520 | 273,736 | 136,487 | 250,000 | 2,408 | 44-55 |
| Others | | 26,075 | 78,365 | 20,039 | 45,000 | 1,326 | 48-55 |
| TOTAL | | 1,135,363 | 1,276,227 | 1,034,433 | 1,495,000 | 50,344 | |
| Poor Ore | | | | | | | |
| Anshan (East) | | - | - | - | - | - | - |
| Anshan (West) | | - | - | - | - | 733,900 | 30 |
| Takushan | | 1,449,670 | 1,710,458 | 736,714 | 3,000,000 | 409,690 | 36 |
| Yingtaoyuan | | 517,360 | 474,727 | 163,179 | 500,000 | 1,661,200 | 30 |
| TOTAL | 7,000 | 1,967,030 | 2,185,185 | 899,893 | 3,500,000 | 2,804,790 | |
| PENCHIHU: | | | | | | | |
| Miaoerhkou | | 362,049 | 371,698 | 470,382 | 500,000 | 9,810 | 60-65 |
| Miaoerhkou | | 271,695 | 632,292 | 536,946 | 2,000,000 | 823,830 | 34 |
| Papanling | | 65,629 | 77,539 | 84,987 | 100,000 | 1,500 | 53 |
| Tungyuanpu | | - | 31,722 | 45,605 | 50,000 | 1,420 | 45 |
| Waitoushan | | - | - | - | - | 130 | 54 |
| Others | | - | 13,415 | 15,780 | - | 740 | 40-52 |
| TOTAL | 4,000 | 699,373 | 1,126,666 | 1,153,700 | 2,650,000 | 837,430 | |
| TUNGPIENTAO: | | | | | | | |
| Talitzu | | 351,491 | 523,751 | 350,000 | 650,000 | 84,044 | 50 |
| Chitaokou | | 260,049 | 326,182 | 320,000 | 350,000 | 27,152 | 40-43 |
| TOTAL | 3,000 | 611,540 | 849,933 | 670,000 | 1,000,000 | 111,196 | |

* Approximate number employed during the 1942-1944 period

Iron mines northeast of Anshan. Locomotive is practically the only piece of surface equipment remaining.

Site of former surface buildings. Group is standing in front of compressor site. Forge shop was on the right. All equipment was removed and buildings destroyed.

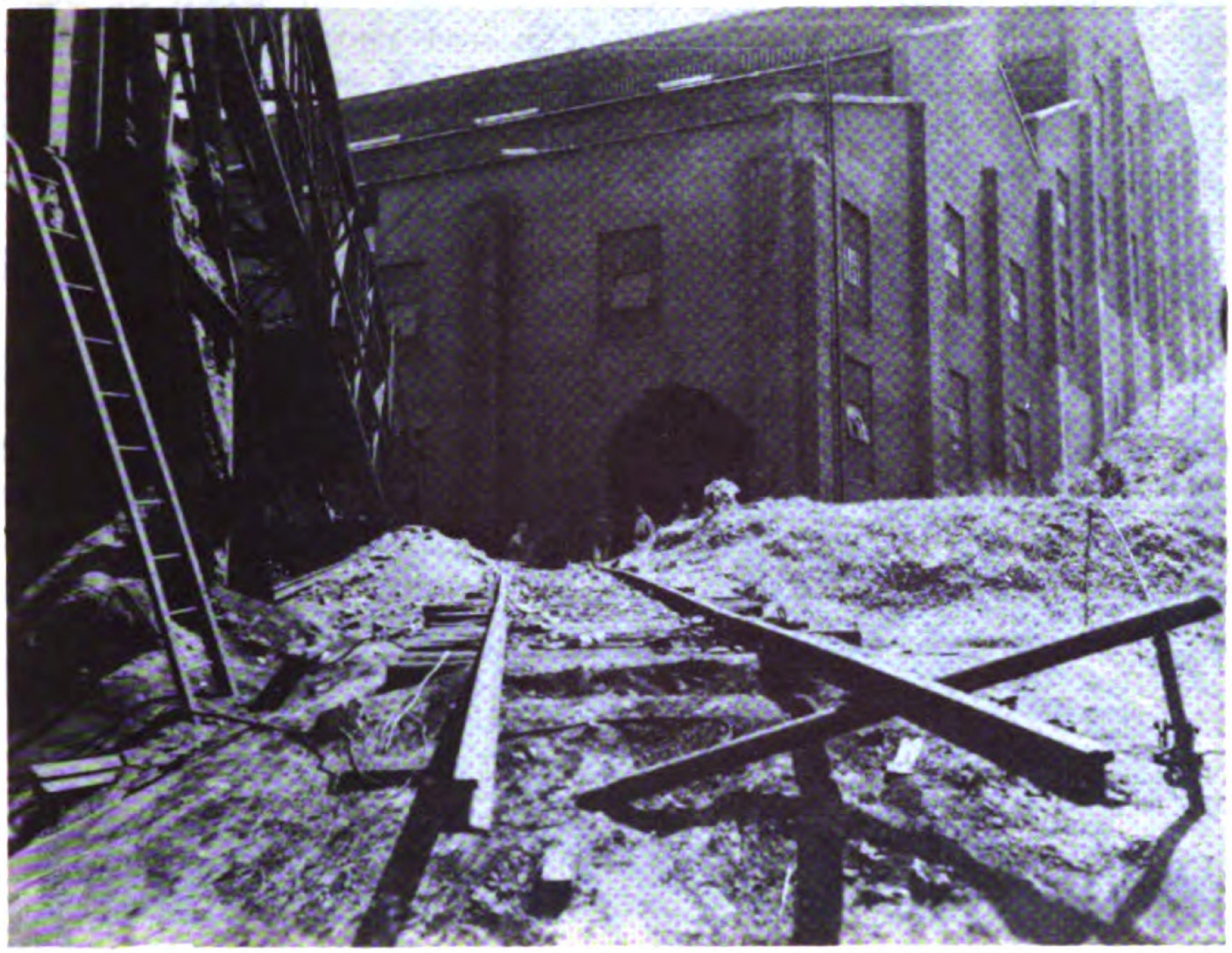
The significant thing about Manchurian iron deposits seems to be that the bulk of the ores is lean in iron and requires concentration before it can be charged into a blast furnace. Under a competitive economy, at least 50 percent of the pig-iron production would be at a cost so much greater than that of other iron-producing nations as to be uneconomic. There is also some question as to the comparative costs involved, should mining be confined to rich ore. In all cases where records are available, the rich ore was found to occur in veins or dykes and to involve underground mining methods, whereas the lean ores are massive and mined by surface and open-cut equipment. The economic problem involved is one which may have to be faced by the Chinese should they attempt to revive the industry on its wartime scale. It would appear that such an attempt will necessitate rationalization or some form of broad economic control, as was exercised by the Japanese.

As mentioned earlier in the report, it was not possible for the Pauley Mission to visit most of the iron mines. Inventories of removals submitted by the Japanese would indicate that they were fairly well-equipped. Removals by the Soviets were reported by the Japanese to have been extensive and to have been of such a nature as to curtail seriously the operation of the mines. Regardless, however, of the condition of the mines, with the present political split between the Chinese Communists and Nationalists and division of territory controlled by each, the pig-iron industry is at a standstill.

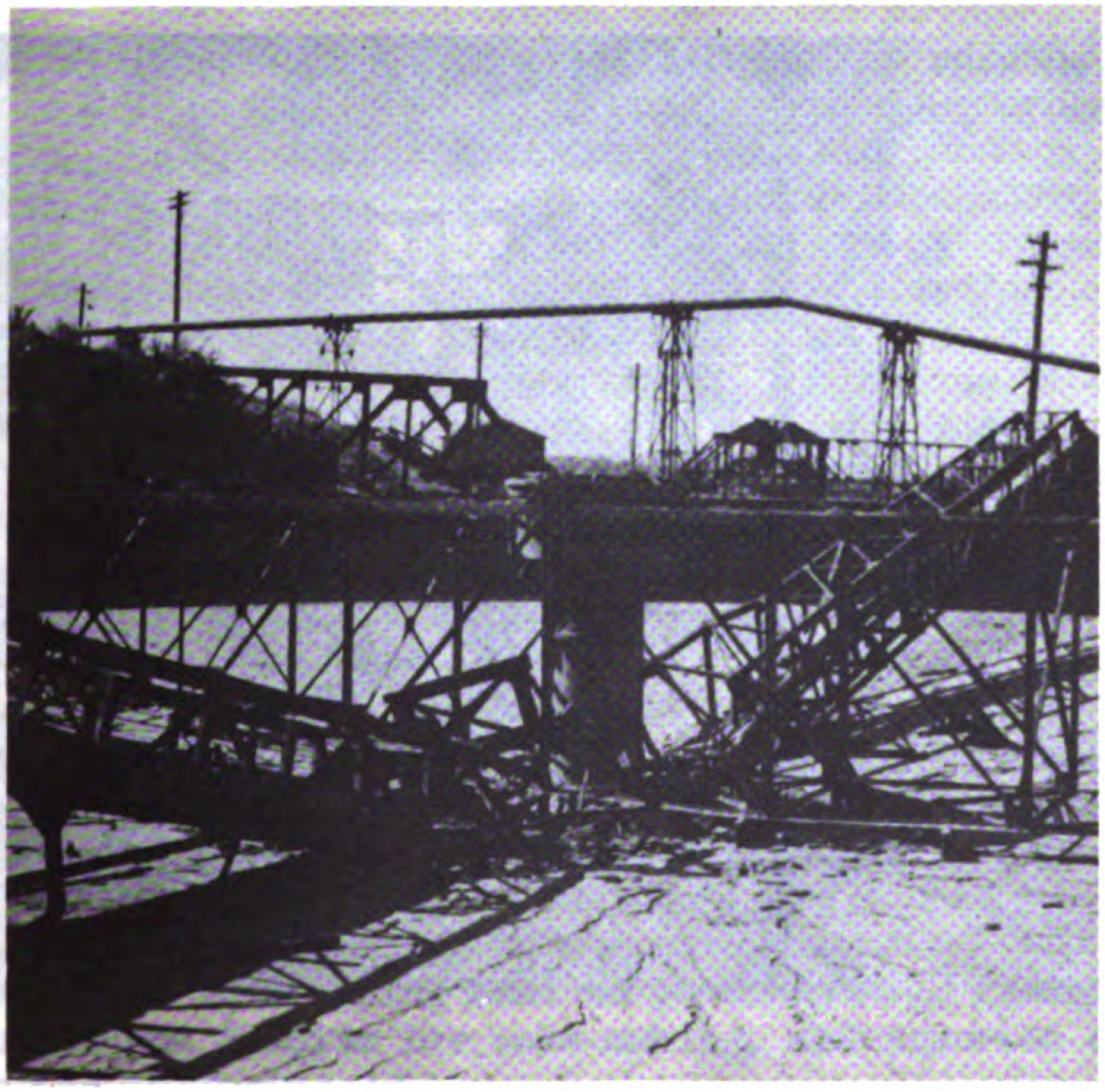
The inventory of mine-equipment removals furnished by the Japanese will be found in Source File No. 202-A-1. It contains a detailed list of equipment taken from the Anshan mines. No such inventory was available for the Penchihu or Tungpientao mine. The Anshan inventory shows 6400 tons of equipment removed from the Tahushan mine, 1100 tons from the Kungchanling mine, 470 tons from the Yintaoyuan Mine and 150 tons from the Yintaoyuan rock drill plant.

The ore-concentration plants for the Penchihu district are located at the mines. Capacity in terms of concentrates is reported to have been 620,000 tons per year. The former Japanese plant manager at Penchihu stated that, with the exception of the underground crushers and oxygen plant, all equipment was removed by the Soviets. There is no inventory available.

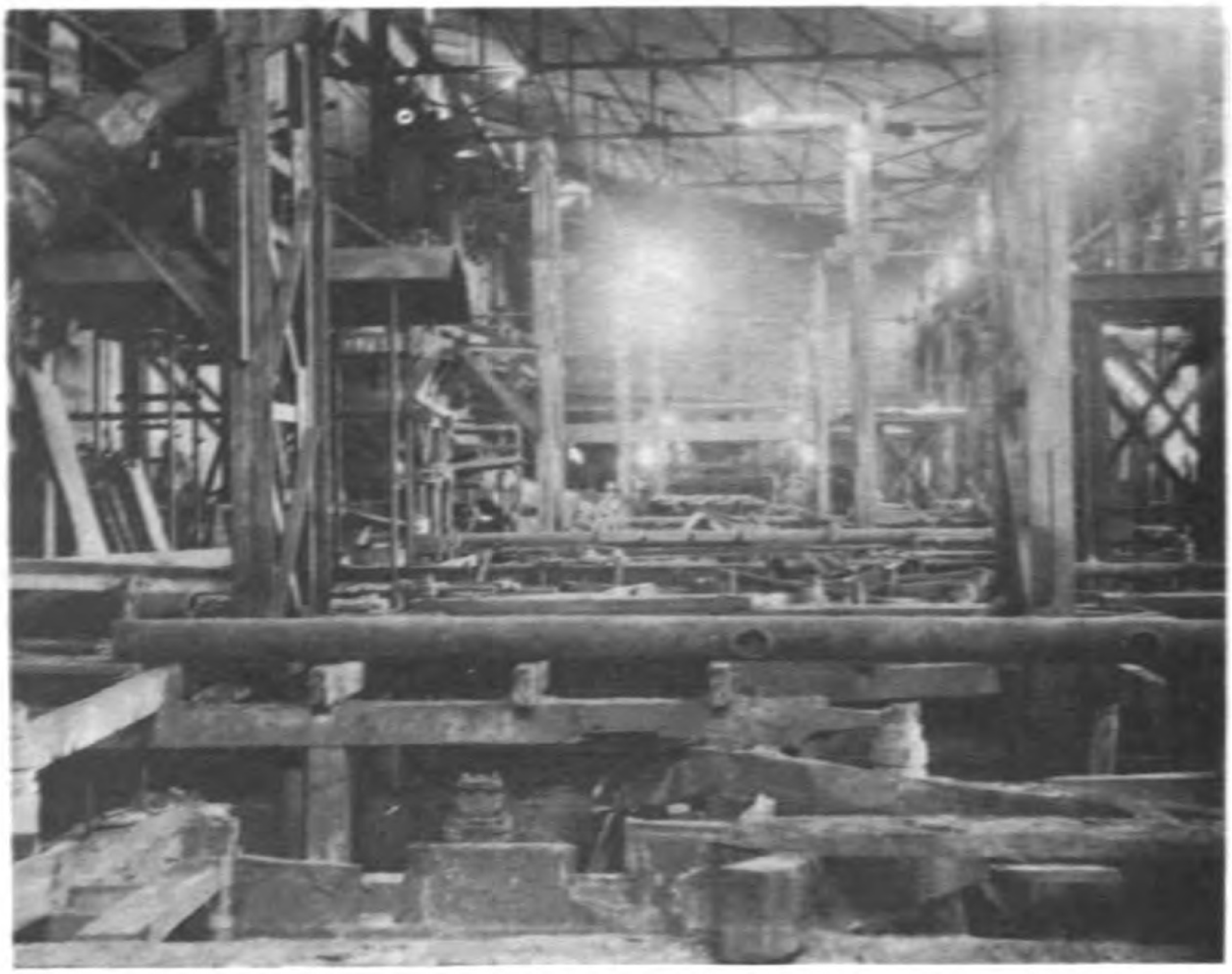
The concentration plant for the Anshan ores is at the main plant at Anshan. It was inspected by members of the Pauley Mission. In terms of concentrates its rated capacity was 1,410,000 tons per year. Practically all the functional equipment, consisting of conveyors with drive mechanisms, crushers, ball mills, classifiers, magnetic separators, thickener mechanisms, pumps and motors, was removed from the concentration plant; all conveyors, motors and small equipment, less furnaces removed from the ore-roasting plant; all drive mechanisms with motors, 6 sets of suction fans with large motors, 6 large and 4 small sintering machines, one 10-ton crane and all feeder tables removed from the sintering plant; all drive mechanisms with motors, 2 compressors, 180 callow cones, 3 filters, 3 ball mills with classifiers,



MANCHURIA IRON AND STEEL CO., ANSHAN - Opening cut in wall and temporary spur track laid into tube mill of ore concentration building to facilitate Soviet removals.

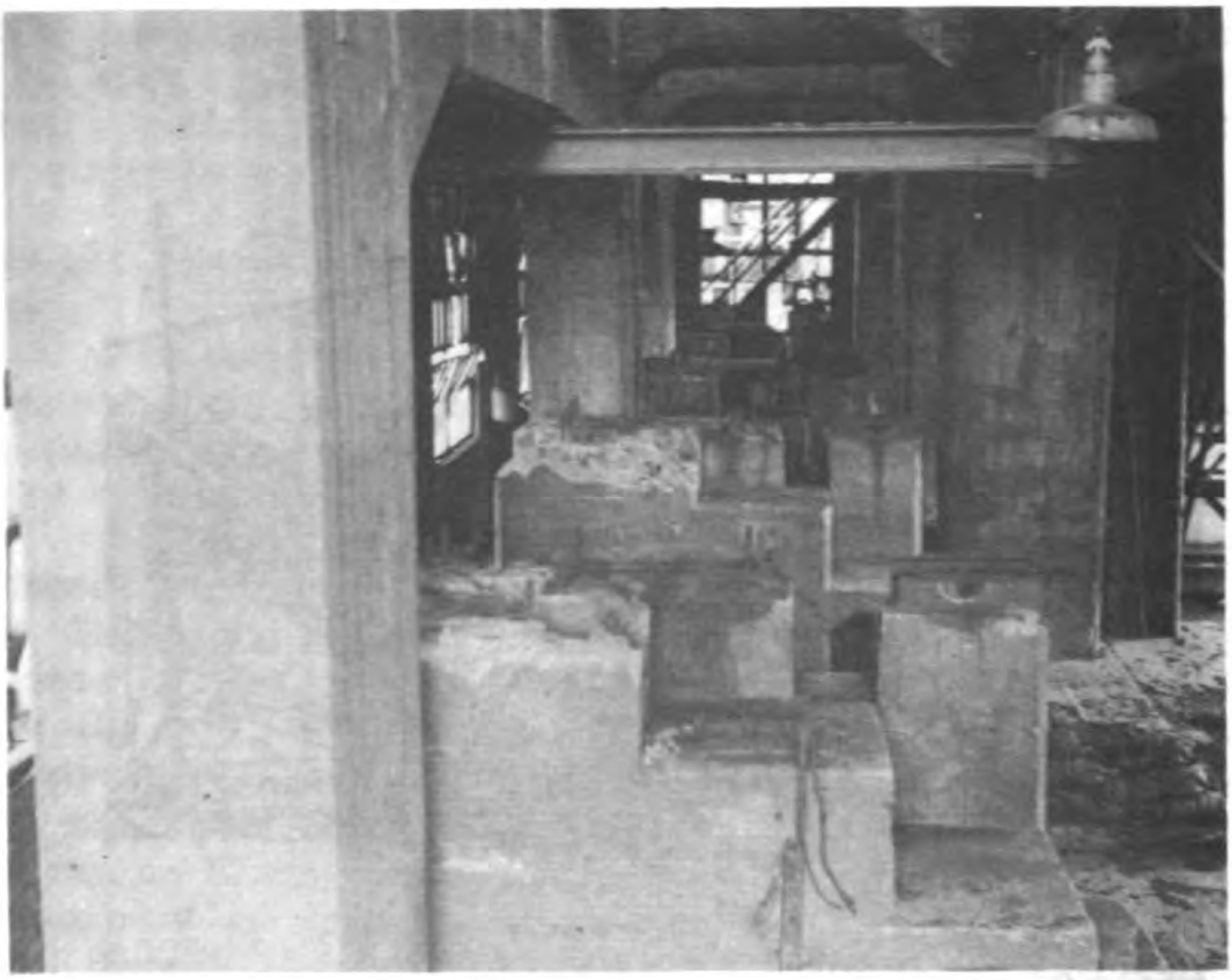


MANCHURIA IRON AND STEEL CO., ANSHAN - Dorr Thickener at Concentration Plant. Drive mechanism has been removed by Soviets.



Concentration Plant of Manchuria Iron & Steel Company - Anshan.

Building from which magnetic separators were removed.



Empty magnetic separator foundations.

30 cones with premagnetizers, 2 vacuum pumps, 2 water pumps and all electrical controls removed from the Middling Concentration Plant. Japanese inventories show 3,780 tons of equipment as having been removed by the Soviets from this series of plants. The plants are, of course, completely incapable of operation.

## F. METALLURGICAL COKE

### 1. Penchihu

The coal mined at Penchihu is a good coking coal but has a low melting ash and excessive swelling properties, so it is mixed with other coals for coking in a ratio of about 3 to 1. Coal is mined from 8 seams dipping about 25 degrees, brought to the surface on belt conveyors and washed and hand-picked to reduce the ash content before coking. Typical analyses of high and low phosphorous coals are as follows:

| | Low Phosphorous | High Phosphorous |
|---|---|---|
| $H_2O$ | .41 | .40 |
| V.C.M. | 18.55 | 12.13 |
| F.C. | 66.4 | 63.1 |
| Ash | 9.6 | 19.4 |
| S | 0.9 | 1.9 |
| P (in ash) | 0.04 | 0.31 |

Coal from Penchihu was partly used in local coke ovens but much of it was shipped to other points, principally Anshan. Production and distribution were reported to be as follows:

| Year | Coked at Penchihu | Other Uses and Exports | Total Production |
|---|---|---|---|
| | (metric tons) | | |
| 1940 | 141,000 | 645,300 | 786,300 |
| 1941 | 235,000 | 415,000 | 650,000 |
| 1942 | 530,000 | 310,000 | 840,000 |
| 1943 | 562,000 | 442,000 | 1,004,000 |
| 1944 | 523,000 | 428,000 | 951,000 |
| 1945 | 123,000 | 77,000 | 200,000 |

Coking was done at both Penchihu and Anshan in 2 batteries of 98 ovens with a daily capacity of 700 tons, and at Kungyuan in one battery of 120 Otto byproduct ovens with a rated daily capacity of 1400 tons.

In addition to shipping coal to other points, Penchihu imported coal from Fushun and Peipiao for coke making, and exported some coke, as seen from the following data:

| Year | Coke Production | Used at Penchihu | Exported |
|---|---|---|---|
| | (metric | tons) | |
| 1940 | 198,130 | 158,000 | 40,000 |
| 1941 | 336,307 | 307,000 | 29,000 |
| 1942 | 433,576 | 401,000 | 32,000 |
| 1943 | 537,503 | 521,000 | 16,000 |
| 1944 | 568,743 | 486,000 | 82,000 |
| 1945 | 148,061 | 114,000 | No data |

Byproducts from coking operations were as follows:

| Year | Tar | Ammonium Sulfate | Benzol | Sulfuric Acid 50° | Sulfuric Acid 66° |
|---|---|---|---|---|---|
| | | (metric | tons) | | |
| 1940 | 6,530 | 1,952 | - | 2,000 | - |
| 1941 | 11,980 | 2,460 | - | 5,060 | - |
| 1942 | 18,590 | 3,045 | 700 | 6,325 | 382 |
| 1943 | 18,690 | 2,959 | 1,390 | 6,148 | 385 |
| 1944 | 19,225 | 4,704 | 2,186 | 6,874 | 209 |
| 1945 | 6,490 | 980 | 343 | 2,245 | 30 |

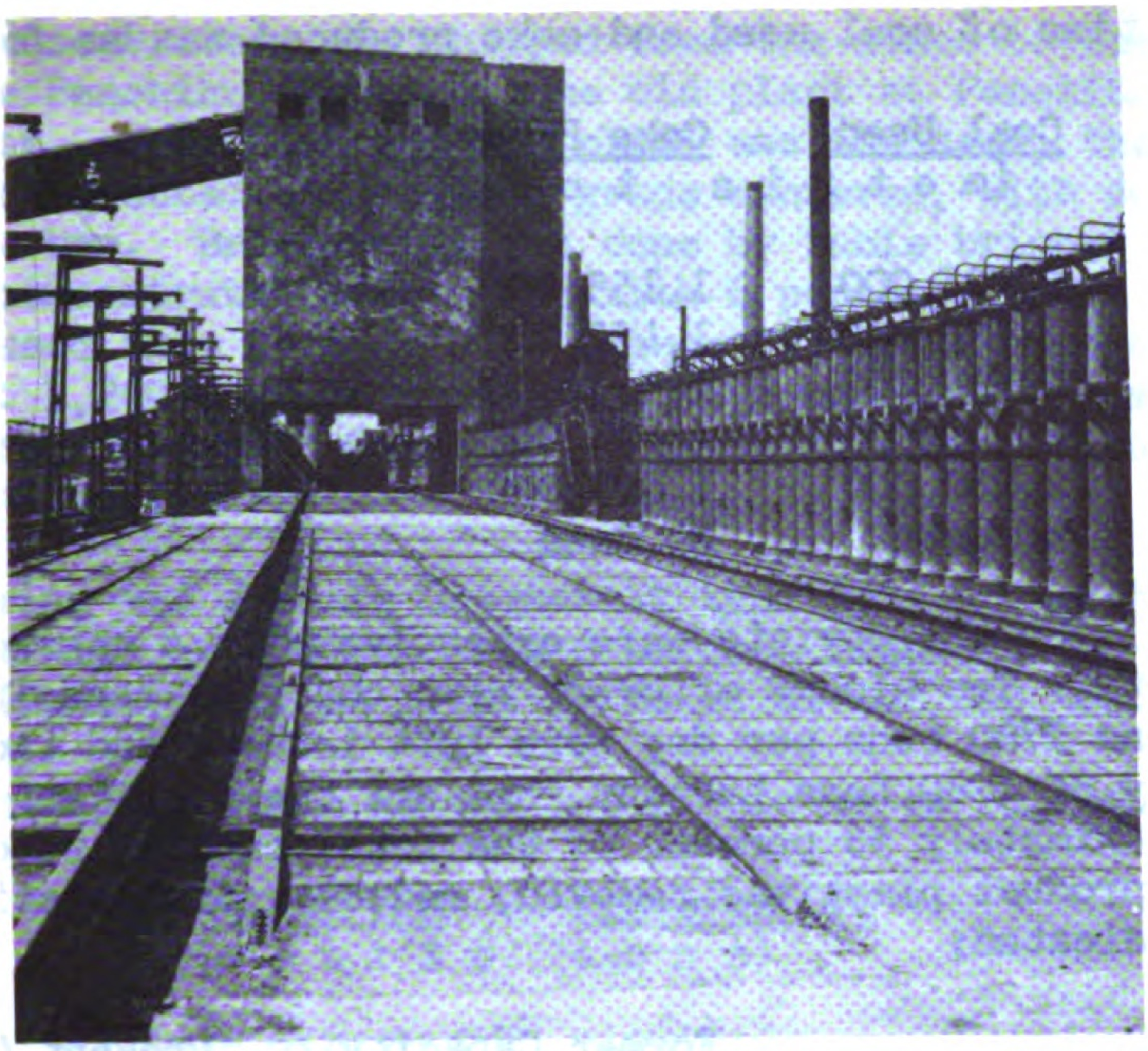
The removals by the Soviets were confined chiefly to equipment incidental to the operation of the ovens and consisted of pushers, door-lifting machines, table feeders, electrical equipment and motors, centrifugal mills, charging cars, pumps, crushers, and quenching cars. While under present conditions they are completely inoperable, the plants could be placed back in operation again with the re-installation of their incidental equipment.

The removals in the byproduct plant were more complete. In addition to the type of equipment removed from the ovens, auxiliary stills, preheaters and major plant equipment were removed. The plant can be considered as permanently out of production.

### 2. Anshan

Fushun, Penchihu and Peipiao were the principal suppliers of coal for the coke ovens at Anshan. North China also supplied large amounts, especially during the latter years of the war.

Coke was made in 4 blocks of coke ovens of 17 batteries containing a total of 216 Koppers cells and 216 Otto cells. All coals were first cleaned by washing. Byproducts produced were crude benzol, sulfuric acid, ammonium sulfate and tar. Further refining of the benzol yielded naphtha, motor benzol, xylol, pure toluol for TNT, and pure benzol for dyestuffs and explosives. Distilled from coal tar were raw anthracene, raw naphthalene, pitch and creosote. Coke-oven gas was produced in quantities sufficient for steel making and all other plant uses.



**MANCHURIA IRON AND STEEL CO., ANSHAN** - Top of newest battery of coke ovens from which accessory equipment including charging lories, pushers, and valve mechanism were removed by the Soviets.

**MANCHURIA IRON AND STEEL CO., ANSHAN** - Coal tar distillation plant. Pumps and fractionating towers were removed by Soviets. Note props used to support roof trusses from which lifting equipment was suspended.

Quantities of coal used and coke produced was as follows:

| Year | Coal Used<br>(metric tons) | Coke Produced |
|---|---|---|
| 1940 | 2,205,000 | 1,155,000 |
| 1941 | 2,782,000 | 1,452,000 |
| 1942 | 2,949,000 | 1,561,000 |
| 1943 | 2,921,000 | 1,644,000 |
| 1944 | 2,260,000 | 1,093,000 |
| 1945 | No data | No data |

Removals by the Soviets were extensive with a consequent reduction in capacity. Two blocks of ovens with charging capacities of 1270 tons per day and 2780 tons per day were left intact, and two blocks each with a capacity of 2780 tons per day, had all the corollary equipment removed. Approximately 53 percent of the total capital recovery equipment of the byproduct plant was removed, reducing its capacity by 70 percent, as indicated:

|  | Former Capacity<br>(metric tons per day) | Present Capacity |
|---|---|---|
| Crude benzol | 120 | 36 |
| Ammonium sulphate | 120 | 36 |
| Tar | 401 | 121 |

For both Penchihu and Anshan, details of process, production records, etc., are given in the individual plant inspection reports in Appendix 5. Inventories of removals, as prepared by former Japanese plant managers, are given in the damage list report for the iron and steel industry, Source File No. 202-A-1.

## G. PIG IRON

### 1. Penchihu

Ore concentrates received at Penchihu were ordinarily segregated into those derived from high and low-grade ores and kept separate in subsequent treatment steps. The purpose was to produce from the high-grade ores a low phosphorous pig, which was exported to Japan for use by the Japanese Navy. The high-grade concentrates were briquetted and smelted with coke from low-phosphorous coal for the production of the low phosphorous pig iron. Typical analyses of ores and concentrates are as follows:

| Material | Percent Fe | Percent $SiO_2$ | Percent P | Percent S |
|---|---|---|---|---|
| Rich Ore | 62 | 16 | .017 | 0.10 |
| Rich Ore concentrate | 69 | 2.8 | .008 | 0.012 |
| Lean Ore | 33.5 | 50.0 | .06 | 0.03 |
| Lean Ore concentrate | 63 | 10.0 | .017 | 0.03 |

The concentrates were shipped from the mines to the two plants comprising the Penchihu district, one old plant at Penchihu and the new one at Kungyuan. Treatment at each plant was the same, the high-grade concentrates briquetted and the low grade sintered, with some overlapping of the two. Briquetting was done by table briquetting machines in which the concentrates were mixed with 6 percent slaked lime, moistened and pressed into 8" x 8" x 2" briquetts, which were burned in a tunnel kiln at 1,250 degrees Centigrade to a porous, firm mass suitable for blast furnace charge. Capacity of the briquetting plant was rated at 400,000 tons per year.

Sintering was done in Greenawalt type pans in batches of 3 tons. Concentrates were mixed with 6 percent limerock and sintered in 40 minutes. Capacity of the plant is rated at 200,000 tons per year.

Combined production of the two plants is as follows:

| Year | Briquetted Ore (metric | Sintered Ore tons) |
|---|---|---|
| 1941 | 237,716 | 37,632 |
| 1942 | 303,938 | 48,838 |
| 1943 | 438,101 | 48,877 |
| 1944 | 346,600 | 46,000 |
| 1945 | 155,000 | 18,500 |

It was reported that the blast furnace charge consisted of briquetted and sintered concentrates only and no data regarding the use of lump ore is available. The production of pig iron for corresponding years indicates that lump ore was used as part of the burden as seen from the following tabulation of pig iron production:

| Year | Low Phosphorous Pig | Common Pig | Total |
|---|---|---|---|
| 1940 | 114,578 | 7,622 | 122,200 |
| 1941 | 149,695 | 17,805 | 167,500 |
| 1942 | 222,910 | 155,590 | 378,500 |
| 1943 | 195,040 | 206,660 | 401,700 |
| 1944 | 263,252 | 110,625 | 373,877 |
| 1945 | 72,339 | 15,730 | 88,069 |

The pig iron was produced in four blast furnaces, two of 200-ton daily capacity at Penchihu, and two of 600-ton daily capacity at Kungyuan, the latter were blown in in 1941 and 1942.

Limestone for blast furnace use was quarried at an adjacent quarry and transferred to the blast furnace storage bins by belt conveyor. Dolomite is also reported to be nearby but statistics on limestone and dolomite production are not available.

No removals were made from the old plant at Penchihu and assuming the availability of power, coke and iron ore it could operate at close to its previous production rate in a short time. The Kungyuan plant, however, suffered sufficient removals to make it inoperative without some major reinstallations. Twenty presses were taken by the Soviets from the briquetting plant, 12 AIB sintering pans and corollary equipment including electric motors taken from the sintering plant, and while the blast furnaces stocks were found to be in good shape, the hoisting equipment, turbo blowers, hot stove valves, mud gun and washer as well as a substantial part of the rolling stock such as charge cars, ladles, locomotives, etc., had been removed. The complete inventory of damage as prepared by the Japanese can be found in Source File No. 202-A-1.

### 2. Anshan

Iron ore was supplied to the Anshan Works from a group of mines 10 to 30 miles east and southeast of Anshan. Ore was mined by open cuts and underground methods, crushed to four inches and screened at the mines. Both high and low grade ores were mined and each was separated into lump and fines. Disposition of the various kinds of ore at the plant was as follows:

(a) High grade lump ore to blast furnace storage bins.

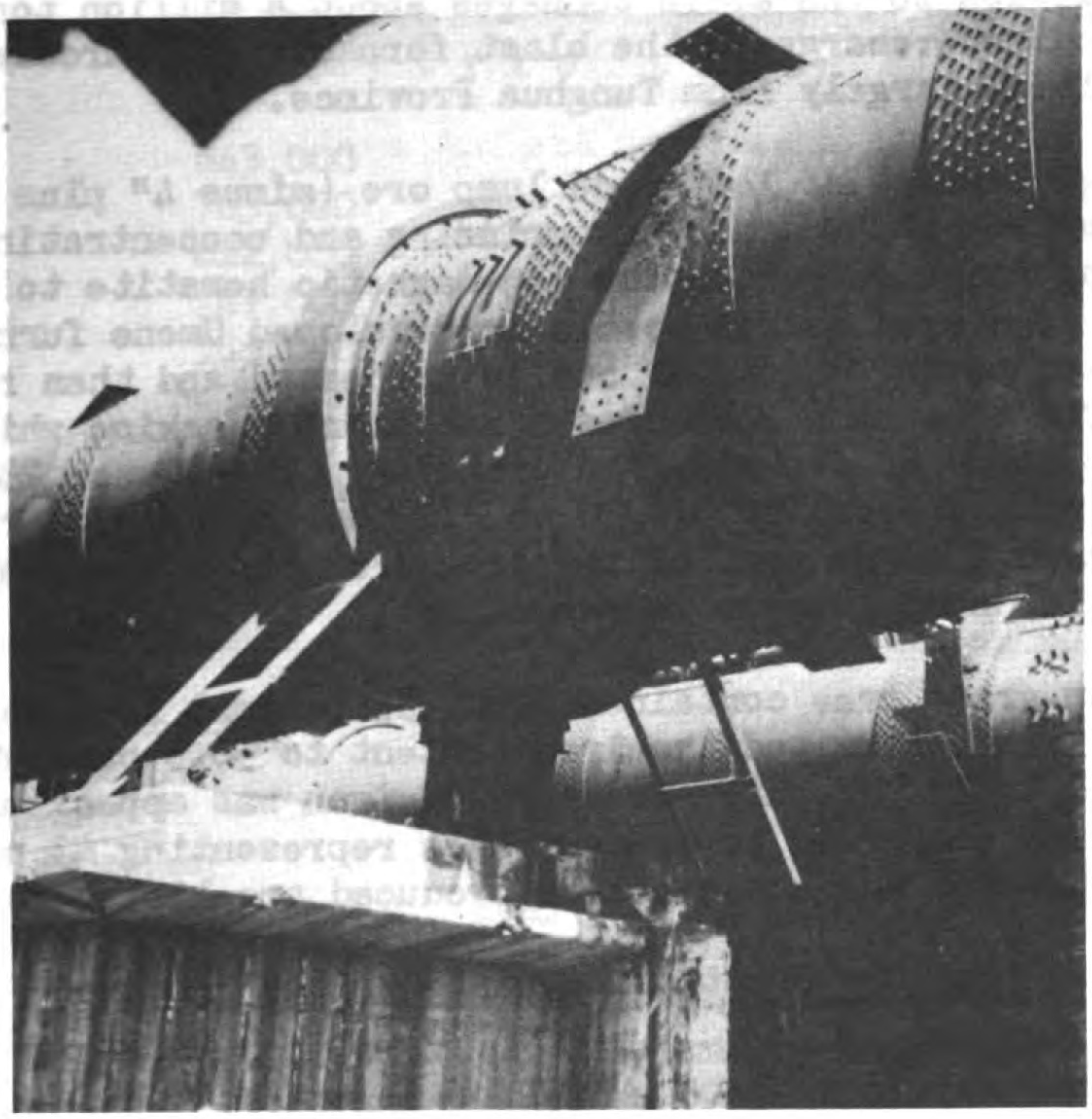
(b) High grade fines to sintering and briquetting plants.

(c) Low grade lump ore to beneficiating plant followed by sintering and briquetting.

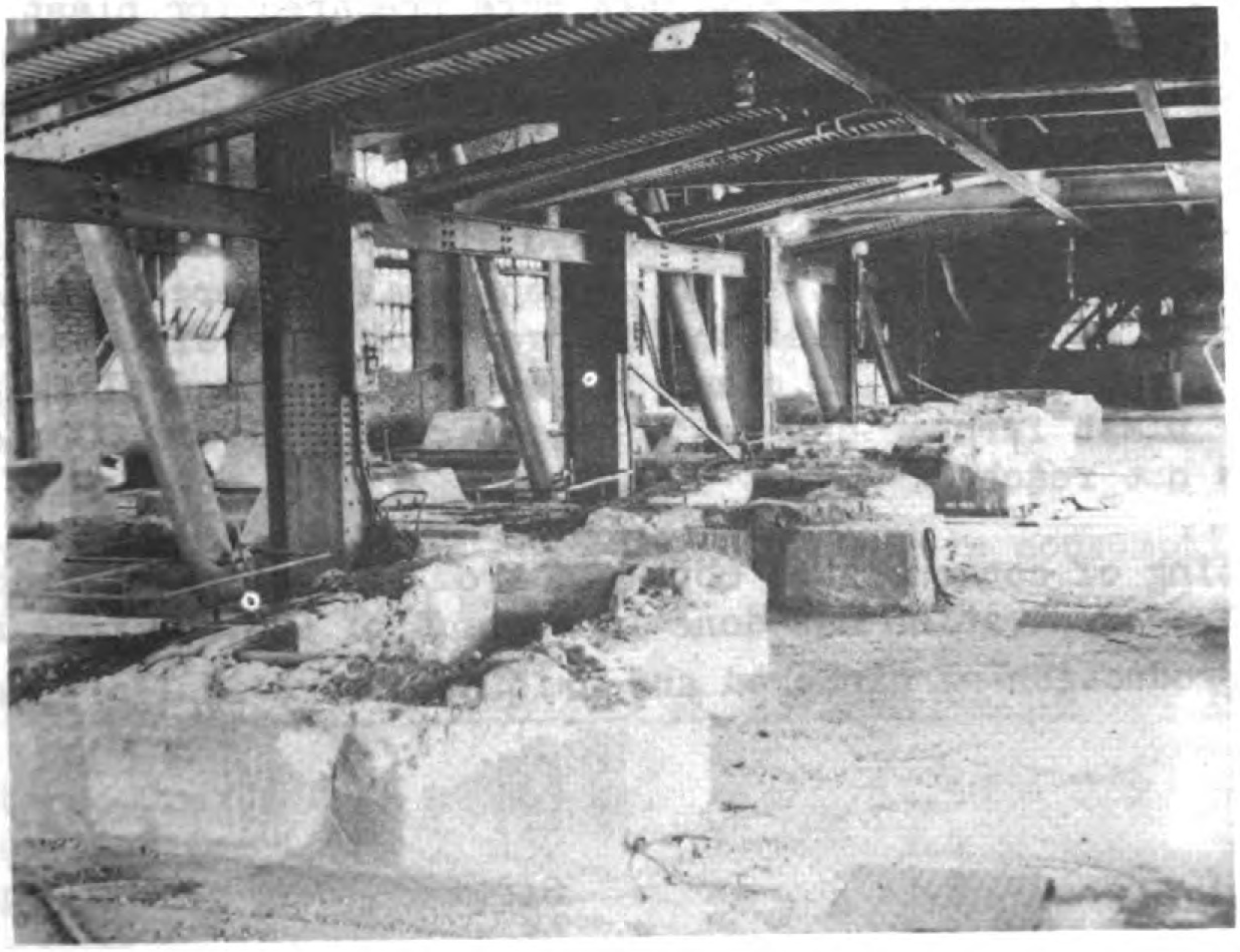
(d) Low grade fines to sponge iron plant.

Tonnages mined from company mines since 1940 are listed as follows:

| Year | High Grade (50% Fe) | Low Grade (35% Fe) | Total |
|---|---|---|---|
| 1940 | 846,000 | 1,619,000 | 2,456,000 |
| 1941 | 1,117,000 | 2,034,000 | 3,151,000 |
| 1942 | 1,146,000 | 1,943,000 | 3,089,000 |
| 1943 | 1,232,000 | 1,893,000 | 3,125,000 |
| 1944 | 1,264,000 | 1,264,000 | 2,528,000 |
| 1945 | no record | no record | no record |



MANCHURIA IRON AND STEEL CO., ANSHAN - Rotary kiln at Sponge Iron plant. Note removal of support rollers. Most of the kilns were entirely removed.



MANCHURIA IRON AND STEEL CO., ANSHAN - Foundations in Sponge Iron plant from which ball mills and motors have been removed by the Soviets.

In addition to the above tonnages about a million tons of high grade ore for direct charge to the blast furnaces was purchased from independent mines, largely from Tunghua Province.

A large tonnage of low grade lump ore (minus 4" plus 1/2") was beneficiated by roasting, crushing, grinding and concentrating magnetically. A reducing roast converted the non-magnetic hematite to magnetite by the use of coke oven gas in specially developed Umene furnaces in which a downward moving column of ore is preheated and then reduced by rising gas. The treatment also caused incipient cracking which aided the subsequent steps of crushing and grinding. There were 23 roasting furnaces each with a capacity of 280 to 300 tons per day. Grinding to 150 mesh released a large part of the iron from the silica and separation was made in Grondal magnetic separators.

The low grade ores contained about 35 percent iron and 45 percent silica. Beneficiation raised the iron content to 56.5 percent and lowered the silica to 17 percent. Recovery of iron was approximately 75 percent which was contained in concentrates representing 43 percent of the ore. Ore treated and concentrates produced are listed as follows:

| Year | Lump Ore Treated | Concentrates Produced |
|---|---|---|
| 1940 | 1,471,000 | 632,000 |
| 1941 | 1,760,000 | 767,000 |
| 1942 | 1,833,000 | 740,000 |
| 1943 | 1,520,000 | 693,000 |
| 1944 | no record | no record |
| 1945 | no record | no record |

The finely ground concentrates were prepared for blast furnace use by either sintering or briquetting. At Penchihu briquettes were preferred to sinter since only about one-tenth of the total was sintered and the rest briquetted while at Anshan the reverse appears to have been the case with only one-fifth briquetted and the rest sintered. Sintering was done on 10 Dwight and Lloyd sintering machines using fuel oil for igniting. Concentrates, 10 percent coal, 6 percent limestone, flue dust and fine ore composed the charge which when sintered was in the form of porous, irregular sized masses of semi-fused clinkers suitable for blast furnace charge. The capacity of 1,000,000 tons annually was not reached.

Briquetting of concentrates obtained from retreating the middlings of the first concentration was done in a plant of 400,000 tons annual capacity. Production of sintered and briquetted ore is listed as follows:

| Year | Sintered Ore | Briquetted Ore |
|---|---|---|
| | (metric tons) | |
| 1940 | 643,000 | 78,000 |
| 1941 | 783,000 | 117,000 |
| 1942 | 822,000 | 126,000 |
| 1943 | 749,000 | 155,000 |
| 1944 | 385,000 | 85,000 |
| 1945 | no record | no record |

The blast furnace department, with a rated capacity of 1,950,000 tons of pig iron, contains 9 stacks as follows:

| Blast Furnace No. | Year Built | Pig Iron Capacity Per day | | |
|---|---|---|---|---|
| 1 & 2 German type | 1919 | 400 x 2 | equals | 800 |
| 3 - American | 1930 | 550 x 1 | " | 550 |
| 4 - German | 1937 | 600 x 1 | " | 600 |
| 5,6,7,8 German | 1938 | 700 x 4 | " | 2,800 |
| 9 " | 1943 | 700 x 1 | " | 700 |
| TOTAL | | | | 5,450 |

The peak production of 1,325,000 tons in 1943 represents 68% of rated capacity. Of this production 37% was basic pig iron containing 1.8 to 2.5% silicon and less than 0.05% sulfur, while 63% was foundry pig containing 2.5 to 3.0% silicon and 0.08% sulfur. An average of 59% of the pig iron was sent to the steel mills in a molten state while 41% was cast into pigs and shipped to Japan.

Production of pig iron and pig iron made into steel are listed as follows:

| Year | Pig Iron Produced | Used for Steel | Exported |
|---|---|---|---|
| 1940 | 939,000 | 468,000 | 471,000 |
| 1941 | 1,192,000 | 480,000 | 712,000 |
| 1942 | 1,304,000 | 674,000 | 630,000 |
| 1943 | 1,325,000 | 774,000 | 551,000 |
| 1944 | 801,000 | 690,000 | 111,000 |
| 1945 | no record | no record | no record |

A typical blast furnace charge and one year's consumption of raw material is listed as follows:

| Material | Weight Per Ton Pig | Percent Weight | Total Tons for Year |
|---|---|---|---|
| Sintered Ore | 565 kg. | 14.5 | 723,264 |
| Briquetted Ore | 132 | 3.4 | 149,033 |
| Lump | 1,318 | 33.9 | 1,746,026 |
| O.H. Slag | 88 | 2.3 Dolo. | 62,212 |
| Flux | 582 | 15.0 | 693,890 |
| Coke | 1,200 | 30.9 | 1,559,602 |
| TOTAL | 3,885 | 100. | 4,934,027 |

The removals of essential equipment from the concentrating, sintering and middling concentrates plant and the accessory equipment from the ore roasting plant has rendered Anshan incapable of processing anything except lump ore suitable for direct charging to blast furnaces. There are, however, none of the nine furnaces capable of operation. Removals by the Soviets were made from six furnaces consisting of the hoisting equipment, turbo-blowers, hot stove burners, pig iron casting machines and pig ladles. One complete loading bridge was removed from the loading bin and one bridge was partially dismantled. Of the three remaining furnaces all were seriously damaged in May 1946 by the Eighth Route Army (Chinese Communist) who set off charges of explosives at each furnace. The resulting tangled mass of debris has prevented examination of the furnace proper but it would appear that some equipment could be "cannibalized" for use on the furnaces which have been stripped.

Two furnaces with a combined capacity of 1,400 tons per day could probably be put in operation in six months time, provided parts could be obtained from outside sources or could be manufactured in local plants capable of limited operations. One of these furnaces was under repair at the time of Soviet occupation and was not seriously affected by removals. It is possible that this furnace could be made operative in three months. Restoration of the entire plant to its 1943 scale of operations would, however, be a major undertaking and would probably take two to three years to accomplish.

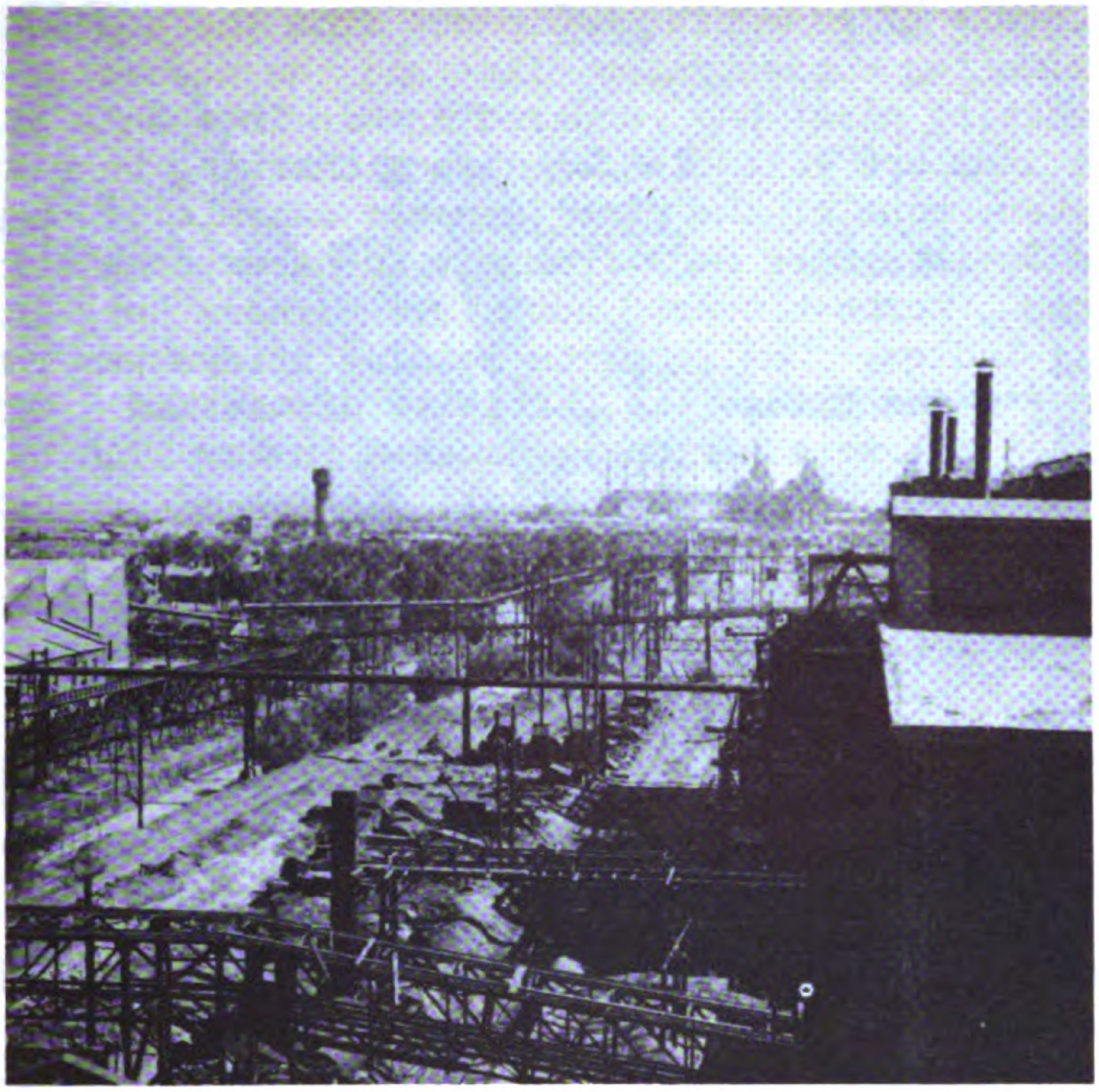
### 3. Distribution and Demand

During the war years approximately 46 percent of Manchuria's pig iron was used in Manchuria and 54 percent sent to Japan. In detail the distribution was as indicated in the following tabulation*.

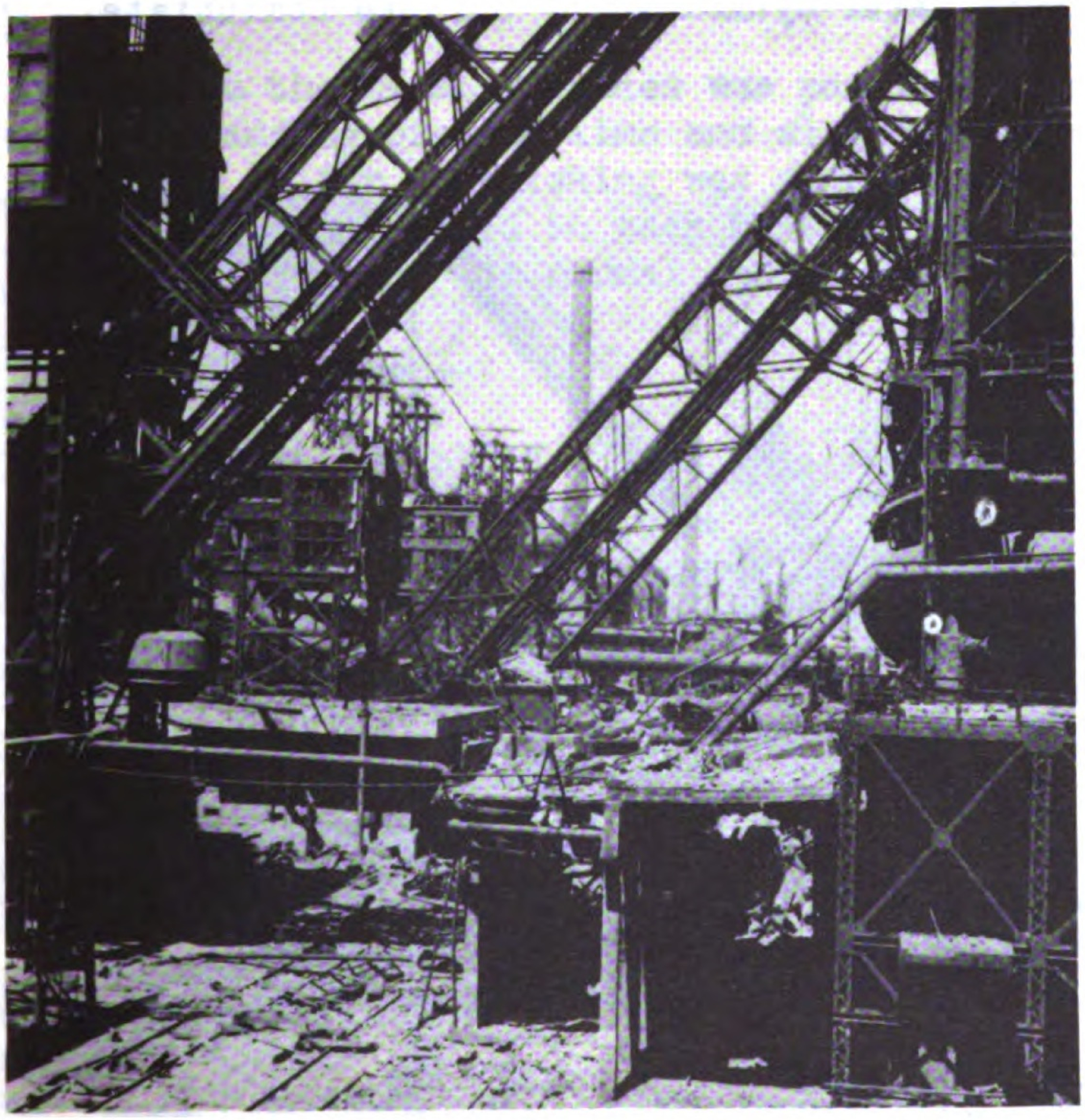
| PRODUCTION | |
|---|---|
| 1942 | 1,340,808 |
| 1943 | 1,710,269 |
| 1944 | 1,159,400 |

---

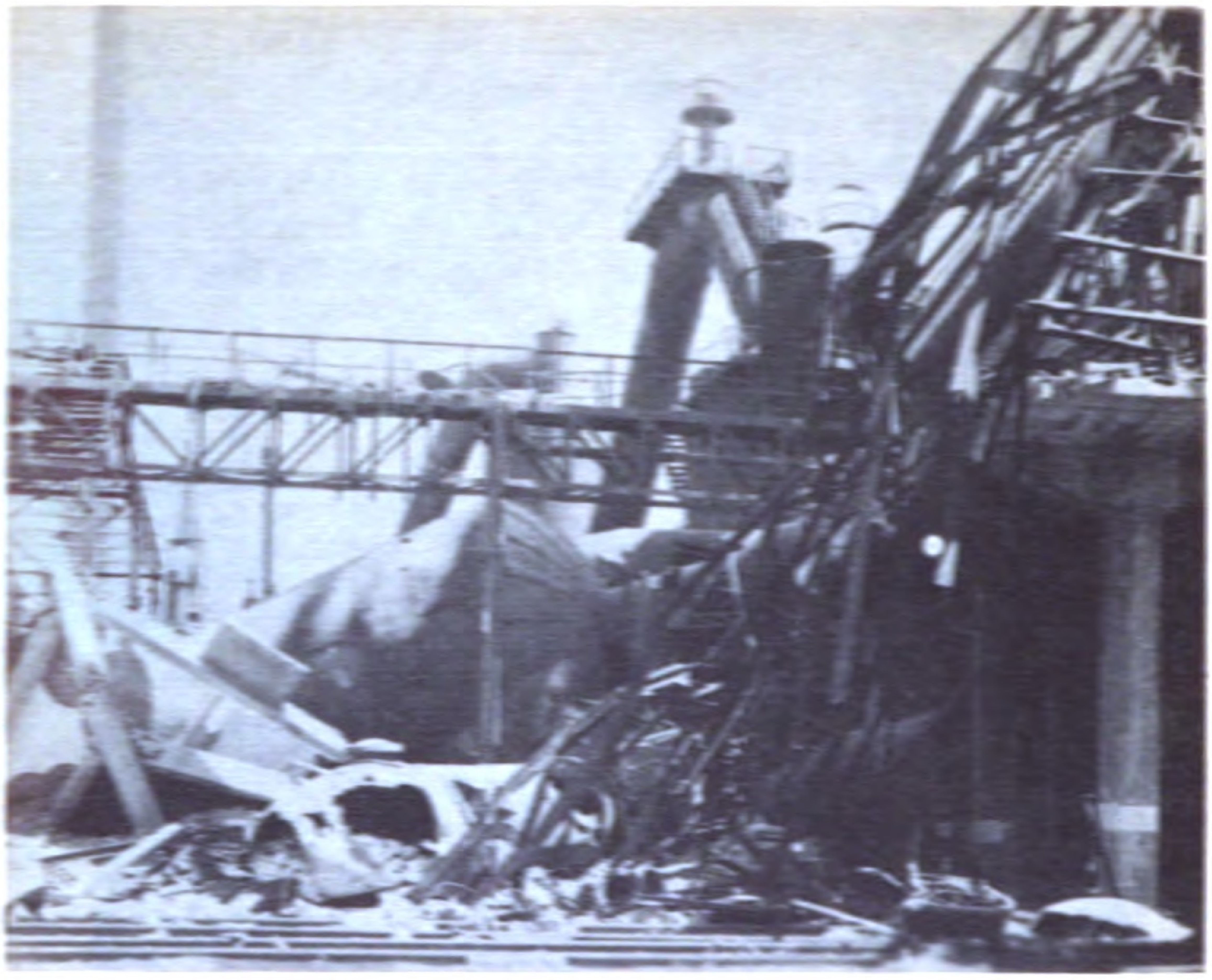
*Figures obtained from Manchurian Industrial Development Company officials at Changchun. (Source File 302 Y.1-1)



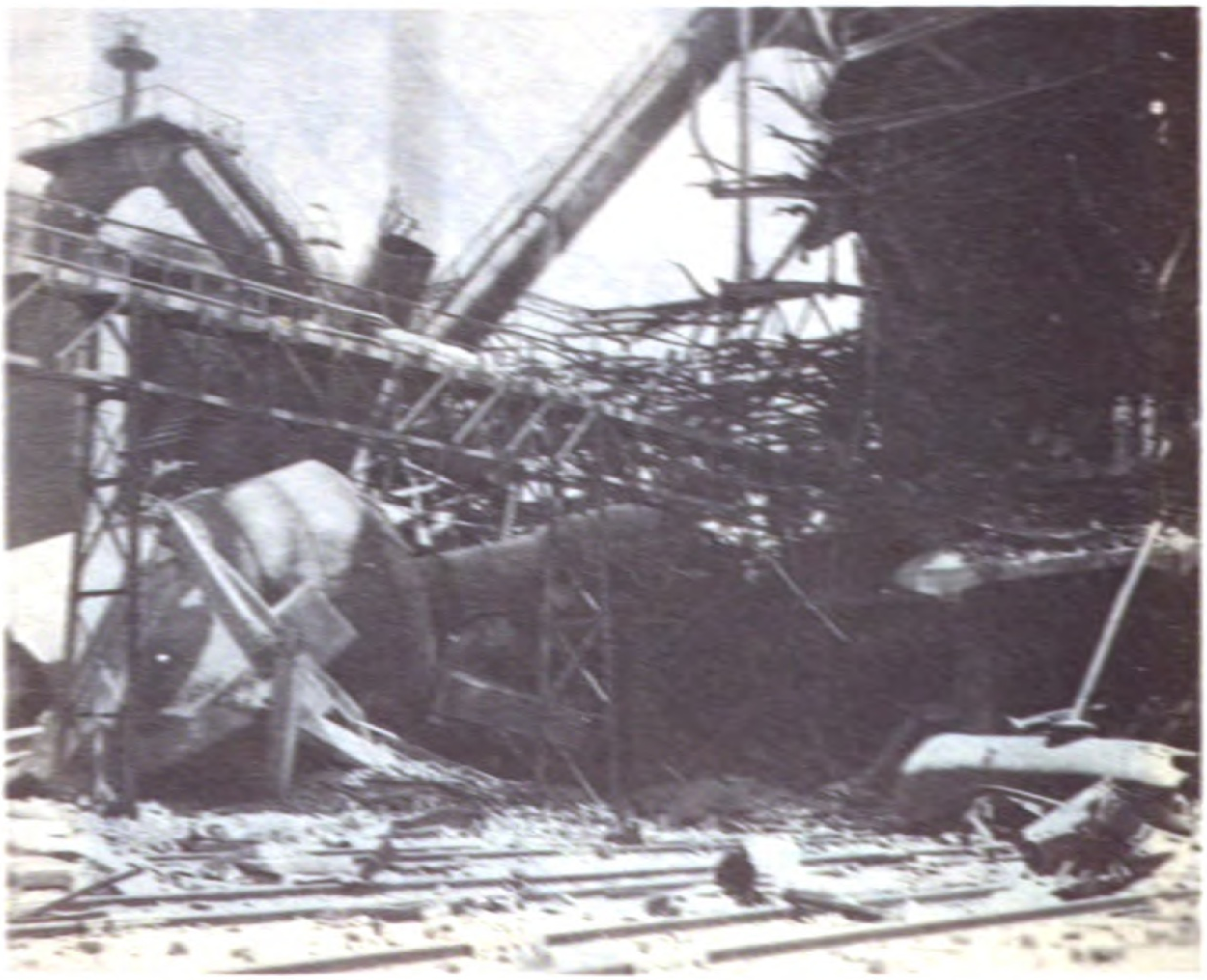
MANCHURIA IRON AND STEEL CO., ANSHAN - Sintering plant on the right, blast furnaces in the distance.



MANCHURIA IRON AND STEEL CO., ANSHAN - Damaged blast furnaces.



MANCHURIA IRON AND STEEL CO., ANSHAN - Showing damage to blast furnace attributed by Nationalists to Chinese Communists forces. Shown are two of the three blast furnaces which remained after the Soviet withdrawal but were later dynamited by Chinese Communists.



| DISTRIBUTION | 1942 | 1943 | 1944 |
|---|---|---|---|
| For Domestic Use | | | |
| Steelmaking | 492,817 | 771,600 | 378,148 |
| Public | 94,792 | 224,792 | 158,000* |
| TOTAL | 587,609 | 996,392 | 536,148 |
| For Japan | | | |
| Exports | 723,555 | 657,273 | 587,252 |
| Japanese Army | 24,644 | 56,602 | 36,000 |
| TOTAL | 748,199 | 713,875 | 623,252 |

## H. STEEL

### 1. Steel Ingots

With the exception of three small 30-ton open-hearths located at the Sumitomo Metal Industries Company plant at Mudken and electric furnaces for making special steels, steel making was confined entirely to Anshan. At the close of the war Anshan had two open-hearth plants both using the active-mixer process. No. 1 plant, built in 1935 was equipped with one 600-ton mixer, three 300-ton tilting active mixers, and four 100-ton and two 100-ton tilting type basic open-hearth furnaces. No. 2 steel plant, completed in 1942, was equipped with two 600-ton mixers, four 300-ton tilting active mixers and six 150-ton tilting basic open-hearth furnaces. Each plant was equipped with soaking pits, ingot strippers, charging machines, ladles and overhead cranes.

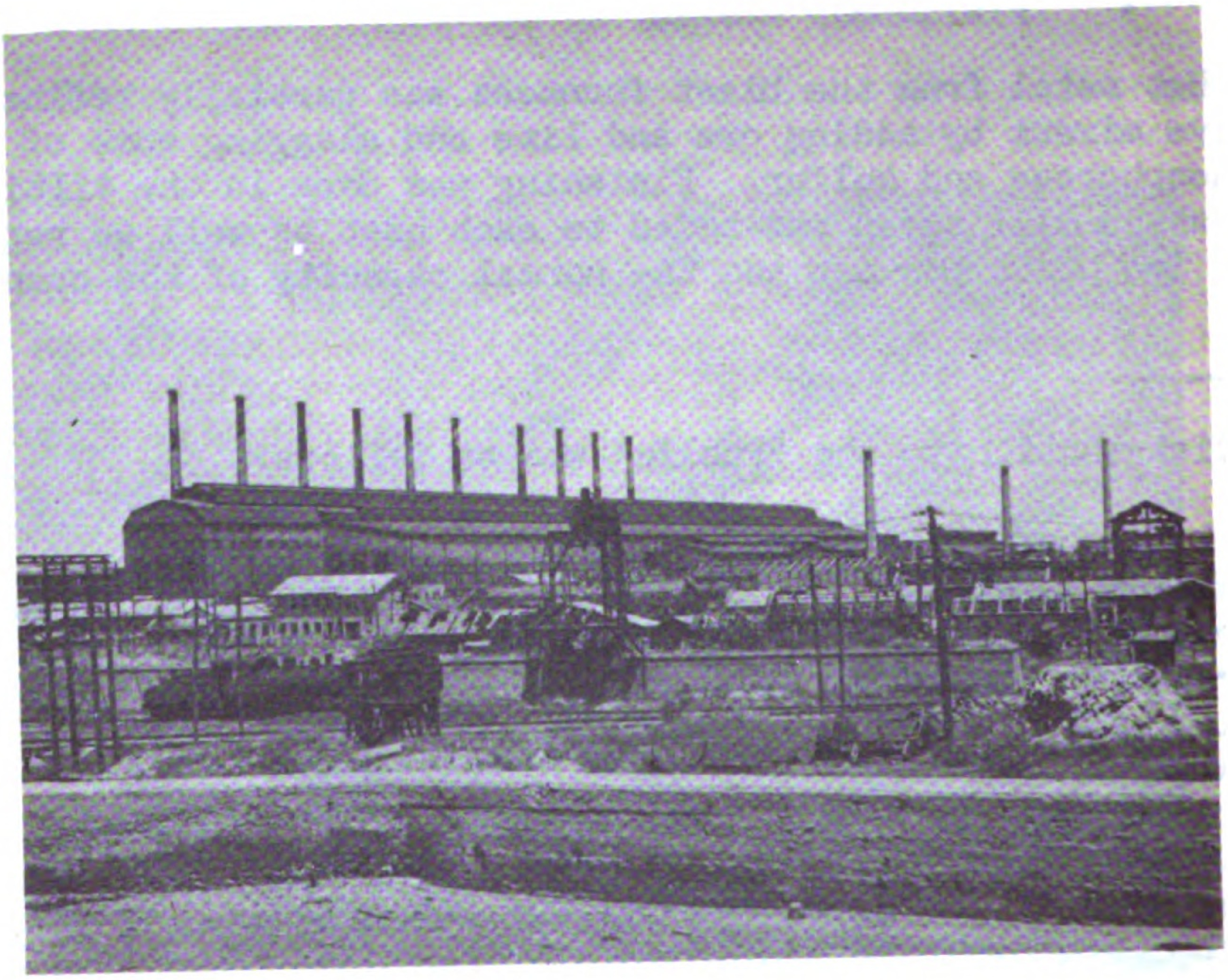
Hot metal from the blast furnaces was partially refined in the active mixers by adding ore and lime and slagging some of the silicon, phosphorous and sulfur. Finishing was done in the tilting open-hearths where mill scrap was added to each heat as well as regular fluxes. Two heats per day was the normal capacity of the open-hearths.

---

* 1944 Distribution to the "Public" was as follows:

| | |
|---|---|
| South Manchurian Railroad | 24,000 |
| Manchukuo Government | 2,000 |
| "Important Industry" (Kwantung Army Arsenals & Munitions Plants?) | 69,000 |
| Public | 5,000 |
| Machinery | 5,000 |
| Air defense | 5,000 |
| Cast Iron Pipe | 32,000 |
| Steel | 16,000 |
| TOTAL | 158,000 |

Anshan as viewed from a hill overlooking the city. The Manchuria Iron and Steel Co. plant is on the skyline.



No. 2 open-hearth plant at Anshan. Heavy Soviet removals have reduced the productive capacity of this plant to zero.

Production of steel since 1940 is listed as follows:

| Year | Steel Ingots Produced |
|---|---|
| 1940 | 532,000 |
| 1941 | 561,000 |
| 1942 | 732,000 (No. 2 plant started) |
| 1943 | 843,000 |
| 1944 | 750,000 |
| 1945 | no record |

No. 1 steel plant had a total capacity of 580,000 tons and No. 2 plant 750,000 tons. Soviet removals have completely destroyed the production capacity of No. 2 plant but as the No. 1 plant was unmolested there still remains in Manchuria facilities for the apparent production of about 500,000 tons of ingot steel. The removals from No. 2 plant were fairly complete and major reinstallations would be required to regain its capacity. In detail the removals consisted of two 600-ton hot metal mixers, the tilting mechanisms of the four 300-ton active mixers and the six 150-ton open-hearth furnaces, four open-hearth charging machines, seven large ladle cranes, seven cranes on the charging side of the open-hearths, four or five cranes over the soaking pits, two ingot tilters and line roll ingot conveyor. In short, the building and open-hearth furnaces remain but all the equipment is gone.

While it would appear that Anshan has an operating capacity of about 500,000 tons of steel ingots actually its dependency upon blast furnace and coke oven gas would prevent its operation until the blast furnaces and coke ovens are restored, or until it is replaced by a newly built producer gas plant.

## 2. Rolled Steel

Under previous operations steel ingots from each of the two Anshan steel plants went to their respective rolling mills. They each contained a blooming mill with a capacity of 500,000 tons per year followed by billet, rail, heavy structural, bar, rod, plate and sheet mills, each fully equipped with hot saws, shears, hot beds, reheating furnaces and inspection tables.

No. 1 Blooming Mill and No. 1 small bar mill were not removed but practically all the mechanical and electrical equipment from No. 2 Blooming Mill and its attendant 24-inch continuous billet mill, small bar mill, medium and thin plate mills were removed by the Soviets. The blooming mill capacity remaining in Manchuria now consists only of the No. 1 mill at Anshan which is 500,000 tons per year.

For rolling special shapes there were a number of mills located at Anshan, Penchihu, and Mukden. The following tabulation shows the nature and capacity of these plants as well as the capacity lost through Soviet removals.

| Company | Type of Equipment | Original Capacity | Production |  | Capacity Lost Thru Sov. Removals |
|---|---|---|---|---|---|
|  |  |  | 1943 | 1944 |  |
| Manchuria Iron and Steel Co. Ltd-Anshan | Large Bar<br>2 small "<br>Thin and Medium Plate | 560,000 | 264,542 | 188,137 | 480,000 |
| Anshan Rolled Steel Company, Ltd. | Light rail<br>Medium, round and square bar | 120,000 | 98,505 | 65,100 | 20,000 |
| Manchuria Sumitomo Metal Ind. Co. Ltd.<br>Anshan Plant | Drawn steel Pipe | 40,000 | 29,537 | 11,350 | 40,000 |
| Mukden Plant | Tires | 15,000 | - | 7,680 | 15,000 |
| Manchuria Japan Steel Pipe Company--Anshan | Welded Steel Pipe | 30,000 | 15,225 | 6,573 | 7,500 |
| Manchuria Otani Heavy Ind. Co. Ltd.--Anshan | Rolling equipment for thick plate | 60,000 | 35,070 | 18,639 | 8,000 |
| Manchuria Kubota Cast Iron Pipe Co. Ltd. | Pipe casting equipment | 50,000 | - | 29,600 | - |
| Manchuria Wire Rope Co., Ltd. | Wire rope equipment | 6,000 | - | 4,100 | 1,000 |
| Manchuria Special Company, Ltd. Steel | Rolling mill for special steel | 9,400 | 2,192 | 3,000 | 4,700 |
| Others - Estimated | Mostly steel wire and small sized mills | 20,000 | - | - | 10,000 |
| TOTAL |  | 910,400 | - | - | 586,200 |

With the exception of a few of the smaller plants all in the foregoing list were visited by members of the Pauley Mission.

The Manchuria Iron and Steel Company rolling mill at Anshan was originally the most complete. Now, due to Soviet removals it is capable only of rolling small shapes, bars, wire rod, etc., to an extent of 15 to 20 percent of its former capacity. The loss of the "large bar mill" was particularly unfortunate as it was the only mill in Manchuria capable of rolling large structural shapes and rails of the type urgently needed for the maintenance and expansion of transportation facilities in China. See Plant Inspection Report 2-A-1 in Appendix 5.

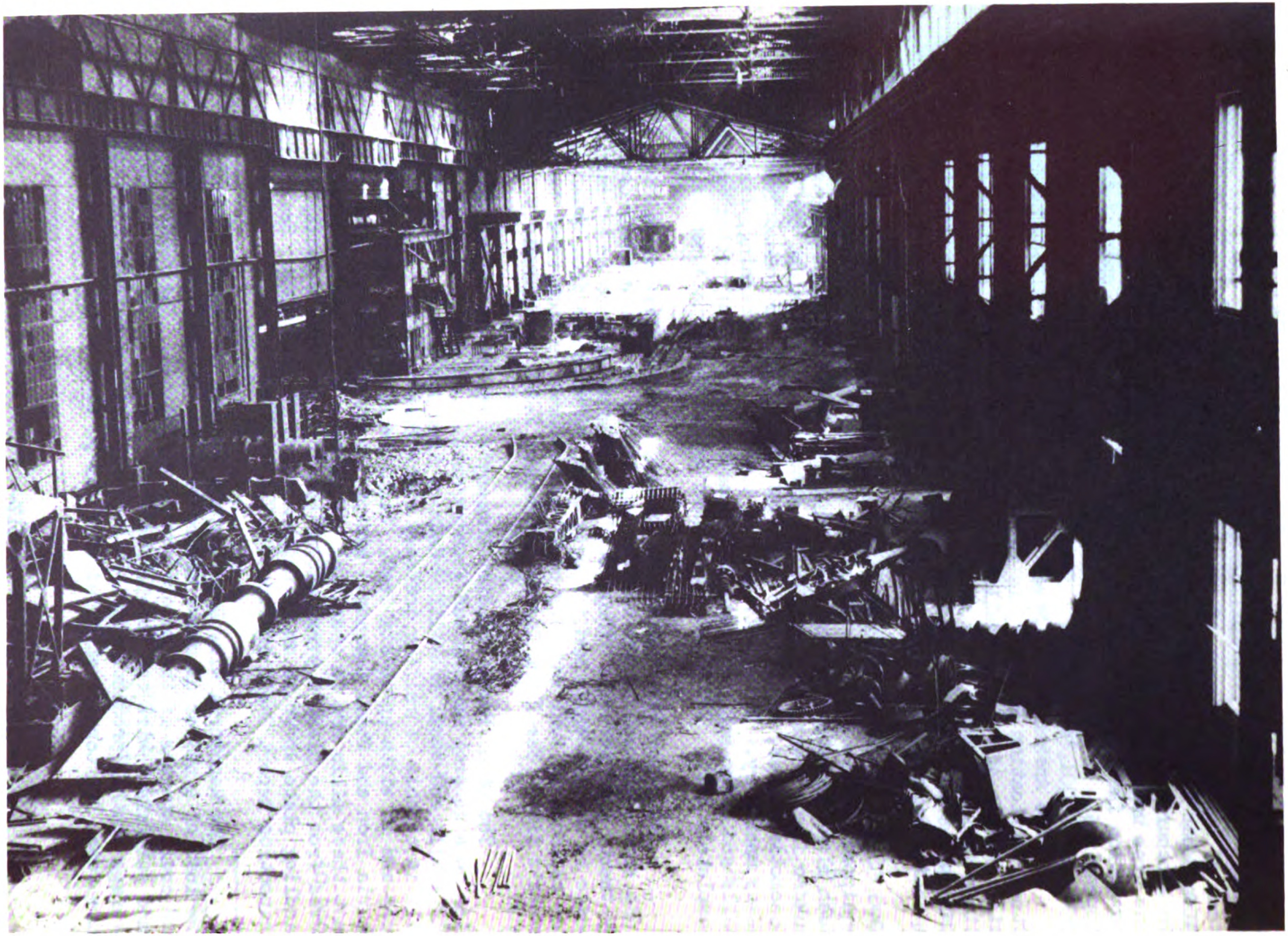
The Anshan Rolled Steel Company, Ltd., (also called the Anshan Steel Fabrication Company), is fairly well intact. It contains a bar mill capable of rolling small bars, rails, shapes and fish plates. Given fuel and power and a source of raw material (90 mm square billets) this plant could be put in operation in a short while. See Plant Inspection Report 2-A-5 in Appendix 5.

The Manchuria Sumitomo Metallurgical Company at Anshan was equipped to draw seamless tubes and tubular products. It was the only such plant in Manchuria and was completely stripped. The company's Mukden factory was equipped for the manufacture of freight car and Locomotive tires, axles and forged and cast parts for locomotives and heavy machinery. It was stripped of presses, tire roughing, finishing rolls and other equipment and its capacity in terms of rolled steel completely lost. See Plant Inspection Report 2-A-2 in Appendix 5.

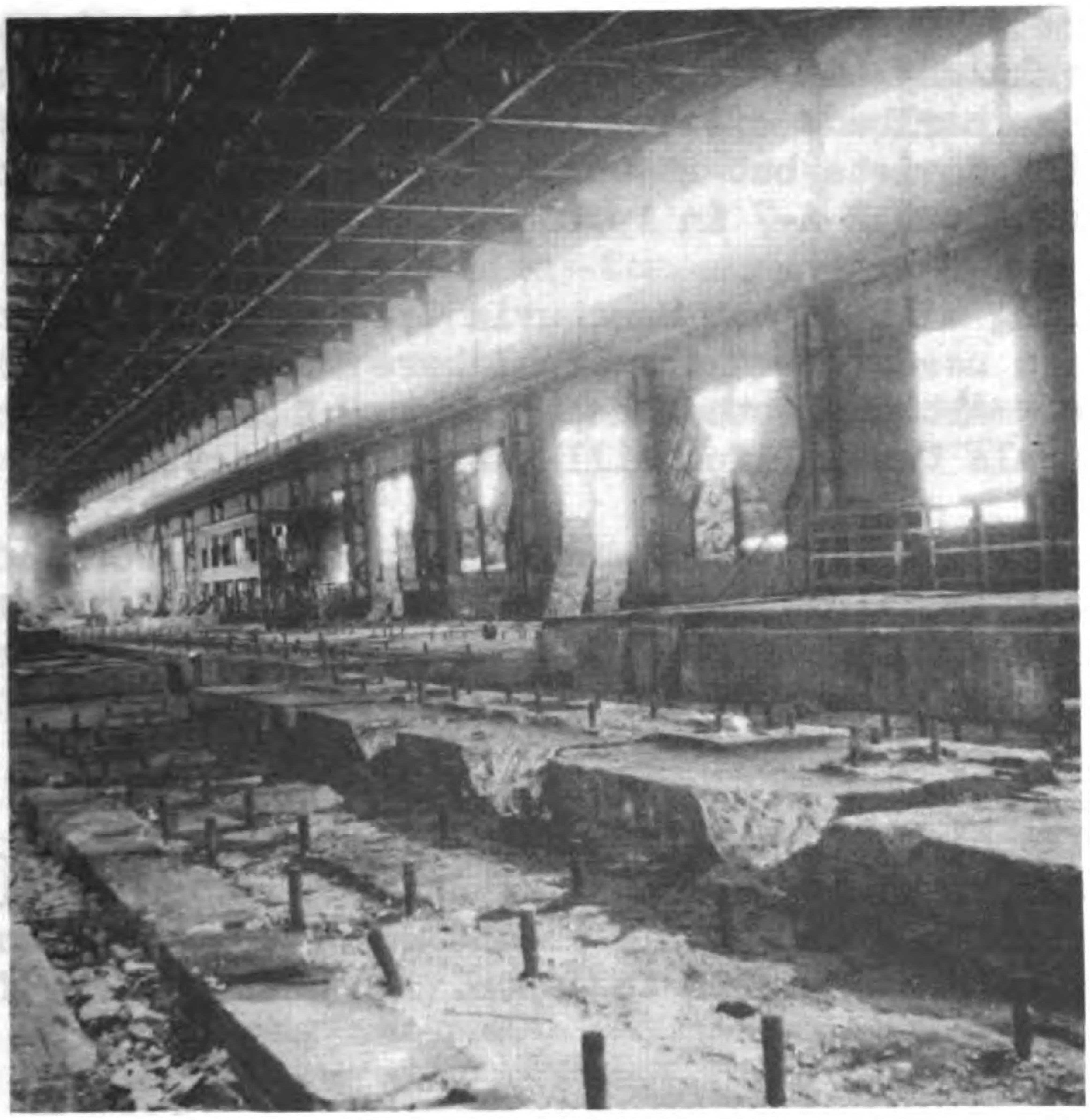
The Japan Pipe Company at Anshan, manufacturers of welded pipe lost some equipment to the Soviets sufficient to reduce their capacity by twenty-five percent. They could commence operations on a limited scale in a short while and if parts could be obtained from other areas for replacement full capacity could be restored in from three to six month's time. See Plant Inspection Report 2-A-4 in Appendix 5.

The Otani Heavy Industry Company's factory in Anshan in addition to a general machine and foundry section is equipped with a small plate mill and small rod mill. Both of them are intact. The plate mill is capable of rolling ordinary plate from 6 mm to 22 mm in thickness and in width up to six feet. Slabs were obtained from the Manchuria Iron and Steel Company. Except for switchboard and control equipment these mills are in operating condition. There was, however, removed from the plant a pyramid type bending roll with capacity for handling plate up to 16 mm in thickness and 10 feet wide. See Plant Inspection Report 2-J-1 in Appendix 7.

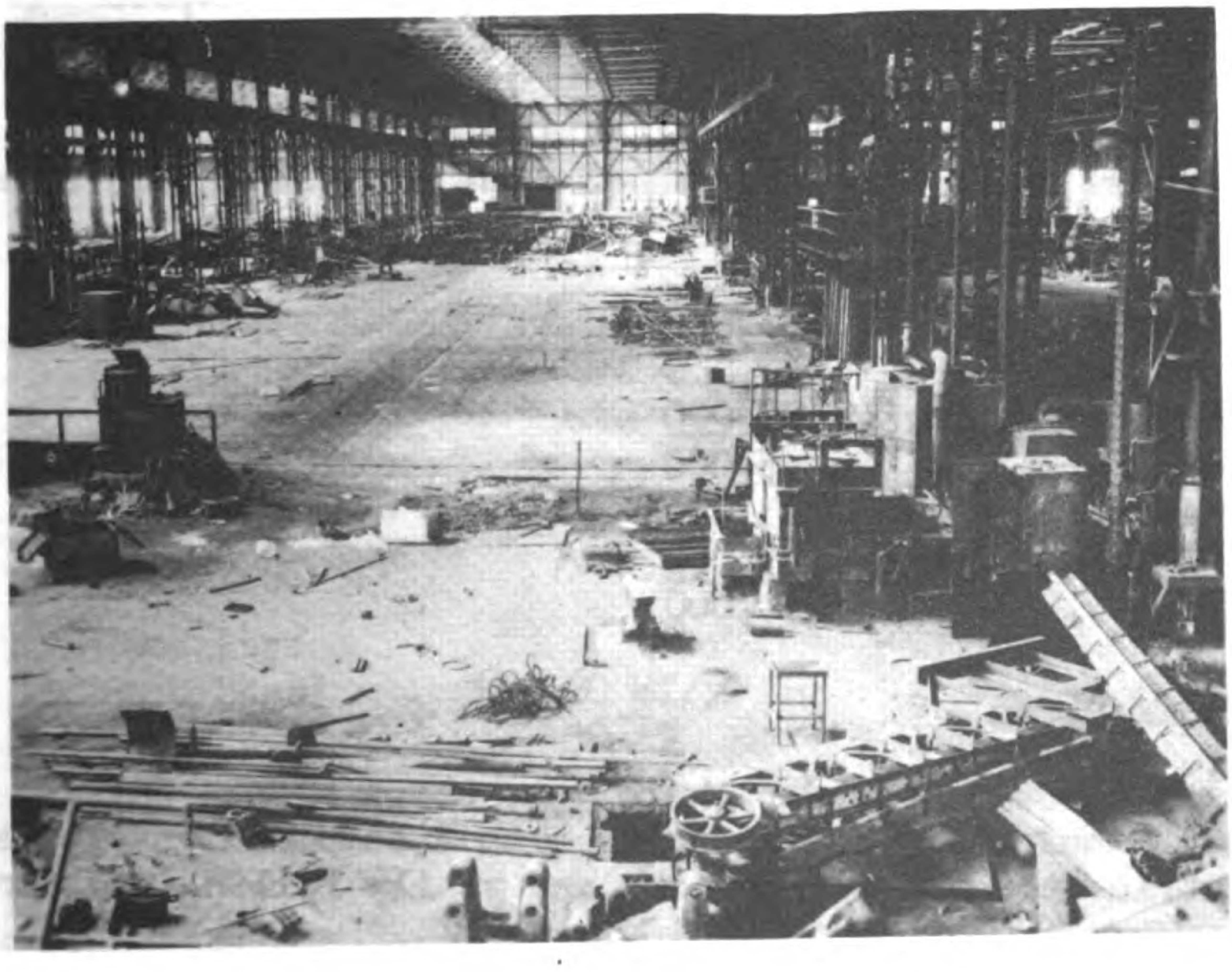
The Manchuria Wire Rope Company's plant at Anshan aside from the loss of a number of drive motors was left intact by the Soviets and could operate if the motors could be replaced. The plant has on hand sufficient wire rod to operate for a period of six months. The average monthly production prior to the end of the war was 264 tons of wire rope, 3.5 tons of stranded wire and 50 tons of galvanized wire.



MANCHURIA IRON AND STEEL COMPANY, ANSHAN - Blooming Mill #2 (steel rolling) from which main rolling equipment was removed during Soviet



MANCHURIA IRON AND STEEL CO., ANSHAN - Rolling mill of No. 2 Steel Works, showing complete removal of equipment.



MANCHURIA SUMITOMO METAL INDUSTRY, ANSHAN - Interior of seamless tube mill. All equipment for making steel tubing was removed.

The need for wire line while the Soviets were occupying Manchuria and conducting removals may be an explanation of their failure to strip the plant. Twenty-one carloads of wire line were reported loaded and about to be taken by the Soviets but at the last moment left behind. See Plant Inspection Report 2-A-7 in Appendix 5.

The rolling mill at the Manchuria Special Steel Company at Penchihu is small and used for making small bars from steel produced in the plant's furnaces. Although other departments of the plant suffered from Soviet removals the rolling mill was left intact.

There are eight plants in addition to those described which can be considered as steel finishing plants. None of them are large, only two being rated at 4,000 tons per year. Removals have been estimated to have cut about 50 percent of the total capacity of these plants. They are mostly engaged in drawing of steel wire.

Figures furnished by the Manchuria Industrial Development Company indicate that wartime distribution of Manchurian rolled steel was chiefly to Manchurian industry with a small amount going to the Japanese Army and a negligible amount exported to Japan. In detail these figures in metric tons are as follows:

| | 1942 | 1943 | 1944 |
|---|---|---|---|
| Production | 457,833 | 485,693 | 282,000 |
| Distribution: | | | |
| For domestic use | 379,533 | 384,893 | 271,000 |
| For Japanese Army | 74,700 | 79,800 | 22,000 |
| Export to Japan | - | 4,000 | 11,000 |
| Export to N. China | 3,600 | 17,000 | |

The steel which went to domestic use in 1944 can be broken down in metric tons as follows:

| | |
|---|---|
| Railway | 103,000 |
| Government | 12,000 |
| Important Industry | 135,000 |
| Public | 5,000 |
| For Machines | 13,000 |
| For Defense | 3,000 |
| TOTAL | 271,000 |

### 3. Special Steel

At the close of the war there were three plants engaged in special steel manufacture in Manchuria with a combined yearly capacity of 71,920 metric tons and with a combined yearly rolling and forging capacity of 32,900 metric tons. The product manufactured was chiefly a carbon steel used for tools, spring steel and military standard goods. Details regarding these plants, furnished by the Manchurian Industrial Development Company, are as follows:

(a) South Manchurian Railway Company
Location—Fushun
Main Equipment:

2 - 15 ton Heroult Electric Furnaces
1 - 6 " " " "
2 - 3 " " " "
1 - 3 " D. H. Hammer
1 - 1 " " " "
2 - 1/2 " A. H. "
2 - 1/4 " D. H. "
1 - 200 H. P. Roll
1 - 700 " " "

Capacity:

| | | |
|---|---|---|
| Steel | 38,000 | MT/yr |
| Forging | 960 | " |
| Rolling | 8,400 | " |

Production:

| | | | |
|---|---|---|---|
| 1942 | Rolling | 5,736 | MT |
| 1943 | " | 5,178 | " |
| 1944 | " | 8,200 | " |
| | Steel | 17,200 | " |

(b) Penchihu Special Steel Company, Ltd.
Location—Kungyuan
Main Equipment:

1 - 6 ton Heroult Electric Furnace
3 - 5 " " " "
1 - 1 " " " "
1 - 500 kg. High Frequency Furnace
1 - 300 " " " "
1 - 2 ton A. H. Hammer
3 - 1/2 " " " "
1 - 1/4 " " " "
1 - 1250 H. P. Roll
1 - 300 " " "

Capacity:

| | | |
|---|---|---|
| Steel | 15,120 | MT/yr |
| Forging | 2,400 | " |
| Rolling | 9,400 | " |

Production:

| | | | |
|---|---|---|---|
| 1942 | Rolling | [illegible] | MT |
| 1943 | " | [illegible] | " |
| 1944 | " | [illegible] | " |
| | Forging | [illegible] | " |
| | Steel | [illegible] | " |

[illegible]: [illegible] Company, Ltd.
Location—[illegible]
Main Equipment:
2 - 5 ton Heroult Electric Furnaces
2 - 3 " " " "
3 - 300 kg. Low Frequency Furnaces
3 - 500 " High " "
2 - 1000 " " " "
1 - 2000 " " " "
2 - 3 ton S. H. Hammer
1 - 1000 H. P. Mill
1 - 200 " " "

Capacity:

| | | |
|---|---|---|
| Steel | 12,500 | MT yr |
| Forging | 3,000 | " |
| Rolling | 2,700 | " |

Production:

| | | | |
|---|---|---|---|
| 1942 | Rolling | 5?8 | MT |
| 1943 | " | 1,112 | " |
| 1944 | " | 1,500 | " |
| | Forging | 916 | " |
| | Steel | 7,000 | " |

The demand and distribution of special steel for the past few years has been as follows:

| Supply | 1942 | 1943 | 1944 |
|---|---|---|---|
| Production | 8,340 | 8,483 | 12,700 |
| Importation (Japan) | 1,498 | 1,397 | 808 |
| TOTAL | 9,838 | 9,880 | 13,508 |
| **Distribution** | | | |
| Domestic | 8,883 | 6,848 | 11,900 |
| Export— | | | |
| Japan | 345 | 486 | 1,015 |
| China | 610 | 1,501 | 1,588 |
| TOTAL | 9,838 | 8,835 | 14,503 |

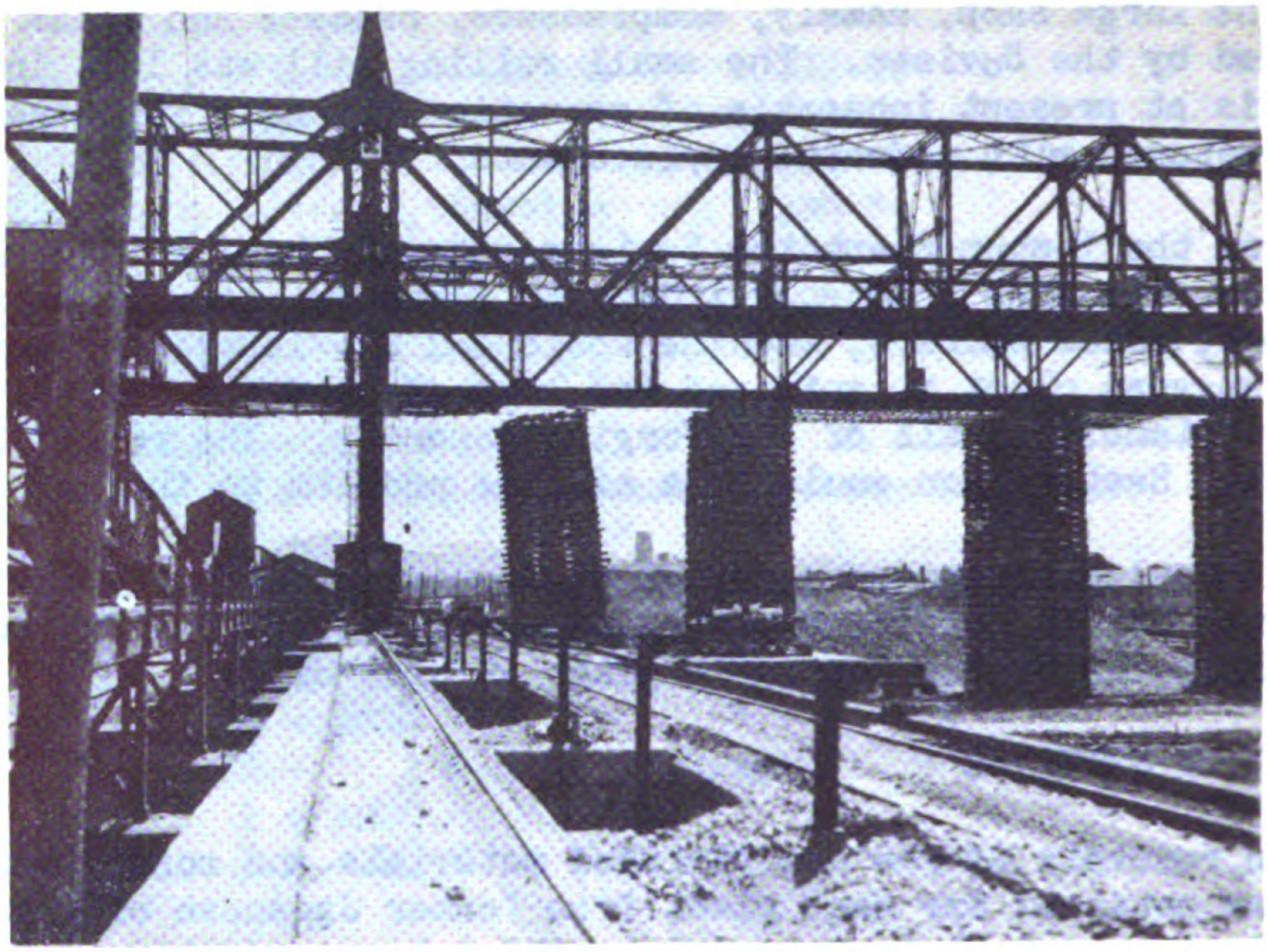
The Fushun and Kungyuan plants suffered very serious removals by the Soviets. At Kungyuan half the melting equipment and the essential parts of the forge shop, namely, compressors, presses and steam hammers were removed by the Soviets. The small rolling mill was left intact. The plant is at present incapable of operation but half its capacity might be restored with moderate replacements.

From the Fushun Plant the Soviets removed three of the electric arc furnaces, the high frequency induction furnaces, as well as numerous cranes, steam hammers, machine tools and the laboratory equipment. Like the Kungyuan plant it suffered the loss of half its melting equipment and substantially all of its forging capacity. The rod mills were left intact. Restoration would be a similar problem to that of Kungyuan.

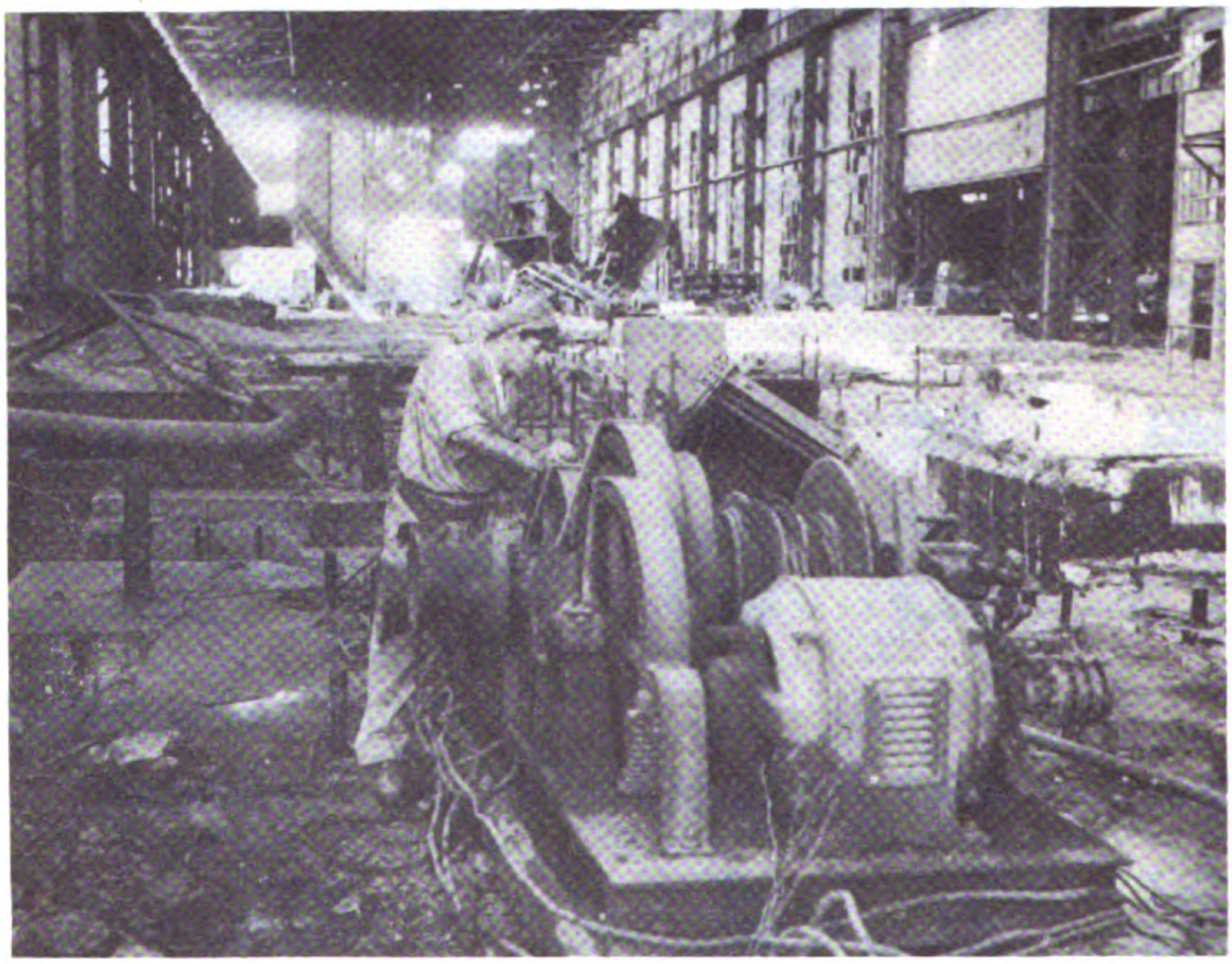
The Pauley Mission was not granted permission by the Soviet Government to enter Dairen despite repeated requests. Nothing is therefore known of the Taika Mining Company's plant at that city.

## I. REMOVAL OF MATERIAL

Data on removals of raw and finished materials and sundry supplies on hand were obtained for each plant from former Japanese officials. It is itemized in detail in Source File 202-A-1 and additional information noted in the individual plant inspection reports in Appendix 5. There is of course no way these figures can be checked but it is considered that they represent a fair estimate of what was removed in each category. Many of the supply items were probably looted by Chinese, but the finished products and such items as structural steel, pig iron, etc., were taken by the Soviets.



MANCHURIA IRON AND STEEL COMPANY, ANSHAN - Cribbing placed under blast furnace stockyard crane from which motors and trolleys had been removed.



MANCHURIA IRON AND STEEL COMPANY, ANSHAN - Winch used for removing heavy equipment from Blooming Mill #2. Empty foundations for steel rolling mill in the background.

## I. TOTAL VALUE OF REMOVALS

The dollar value of the loss due to Soviet Removals in the Iron and Steel Industry can therefore be stated as shown in the following table. Present U. S. values of yearly capacities to produce iron and steel were used for computations.

| | |
|---|---|
| Ore Concentration | |
| 2,030,000 tons/yr at $10/ton | $20,300,000. |
| Coke Oven Plants | |
| 2,016,000 tons/yr at $5/ton | 10,080,000. |
| Pig Iron | |
| 1,786,000 tons/yr at $15/ton | 26,790,000. |
| Sponge Iron | |
| 110,550 tons/yr at $20/ton | 2,211,000. |
| Steel Ingots | |
| 750,000 tons/yr at $10/ton | 7,500,000. |
| Blooms | |
| 500,000 tons/yr at $8/ton | 4,000,000. |
| Billets | |
| 500,000 tons/yr at $8/ton | 4,000,000. |
| Finished Steel | |
| 586,000 tons/yr at $45/ton | 26,379,000. |
| Mining Equipment | |
| Estimated value of equipment removed | 10,000,000. |
| Estimated value in loss due to removals of finished products, supplies, coal, and liquid assets, plus loss and destruction to buildings: | 20,000,000. |
| TOTAL Loss to Iron and Steel Industry: | $131,260,000. |

## CHAPTER VI

## RAILWAYS

### Outline of Industry.

Railways have been the center of Manchuria's stormy economic and political development since 1890. A Japanese evaluation of the South Manchurian Railway as taken from the 1940 edition of the Japanese Manchukuo Year Book is as follows:

> "The South Manchurian Railway Company has been the bulwark of Japanese political and economic interest in Manchuria for the past three decades. The importance of this semi-governmental Japanese concern has been considerably augmented since the founding of Manchukuo, and in many branches of state undertakings of this newly established nation the S.M.R. is vested with supervisory control. Mention may be made of the state railways, mining, public utilities, harbor works, and the communication system, all of which are handled directly, or indirectly through subsidiaries, with the South Manchurian Railway Company.
>
> "The South Manchurian Railway Company appraised its property conservatively in 1937 at two billion yen. With regard to capital, great corporations comparable to this are found in the world, but in the extent of its activities, in the magnitude of its mission, and its meritorious achievements during the past thirty years, the company enjoys a singular position. With 170,000 employees in 1939, it directly or indirectly swings a heavy pendulum in Far Eastern affairs." (p. 842)

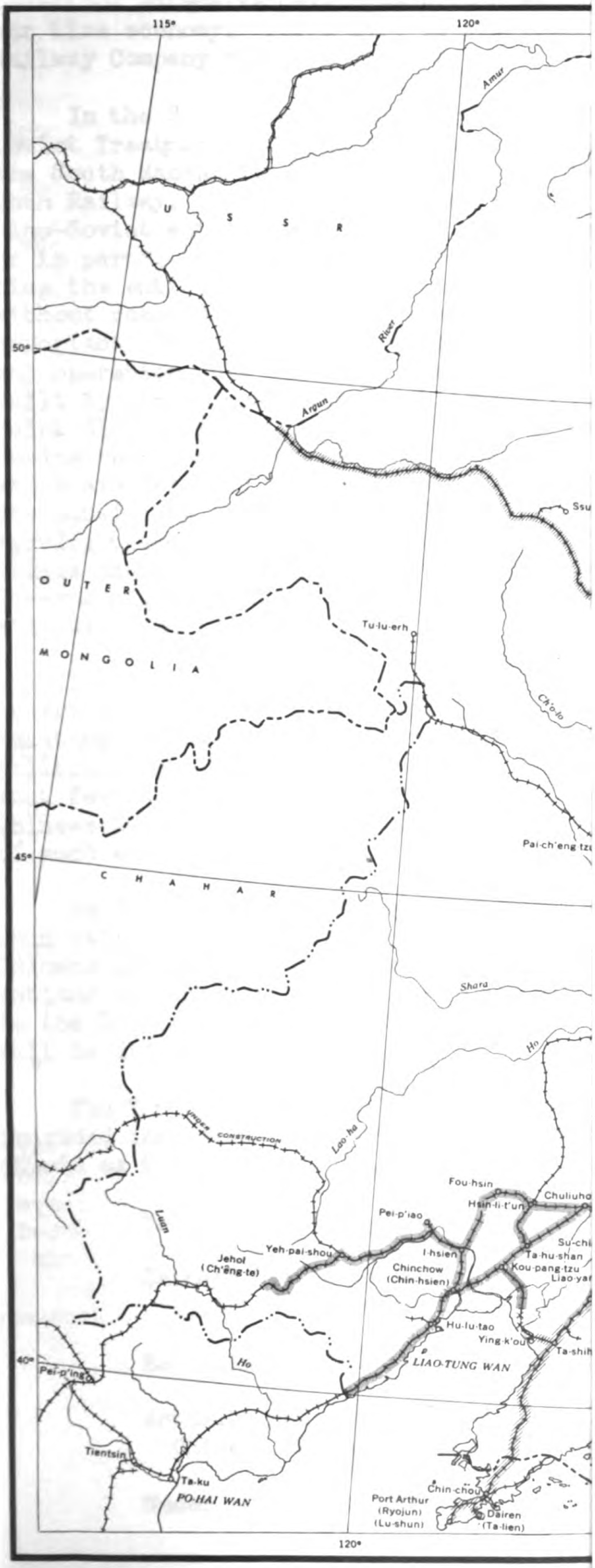
The first railway development in North China was by British capital in the form of the North China Railway, whose primary function was transporting coal from the mines at Kaiping to Tientsin. British capital continued to expand this railway north during the 1890's and soon aroused active opposition on the part of Russia, who in 1896 obtained a concession from the Chinese Government to build railways east and west across Manchuria and also south to Port Arthur. Russia considered that Manchuria was definitely within its sphere of influence and along with the concession to build the railway obtained "absolute and exclusive right of administration" within the railway zone. The concession was to run for eighty years from the time of completion of the road (1 July 1903) when it was to revert to China without payment. China had the right to redeem the road at the end of 36 years (1939) by paying the entire cost of the road. The right of administration included the right to maintain armed guards, a duty that could be performed by soldiers. The presence in Manchuria of numerous bandit gangs was cause enough to move substantial units of the Russian army into Manchuria to act as railway guards. During the Boxer Uprising in 1899 Russian troop movements into Manchuria were heavy. Large elements of the Russian forces remained in Manchuria after the bulk of other foreign troops were withdrawn from China in accordance with the Boxer Protocol of 1901. By 1903 the Russians had extended their Chinese Eastern Railway, and its administration, to Port Arthur. The Japanese became alarmed at the Russian advance and the Russo-Japanese war followed. Following this war and the Treaty of Portsmouth in 1905, the Japanese took over all of the Chinese Eastern Railway south of Changchun, together with rights of administration and maintenance of armed guards in the railway zone. The Russians still owned the Chinese Eastern Railway across Manchuria from Manchuli to Suifenho and the leg from Harbin to Changchun. About 804 kilometers of railway was acquired by Japan from the Russians at this time. Later, the Japanese negotiated a series of railway loans with the Chinese which lead to Japanese control of the Kirin-Changchun and the Kirin-Tunhua railways.

The South Manchurian Railway Company was founded under Imperial Ordinance No. 142 of June 7, 1906. The Japanese promptly proceeded to reduce the broad Russian gauge of 5 feet down to the Japanese narrow gauge but shortly thereafter reconverted to the standard gauge of 4' - 8-1/2". Also, the 65 pound Russian rails were replaced by 85-pound rails which in turn were replaced by 100 pound rails, as are used today.

As an aftermath of the first World War and the Russian Revolution, a number of changes took place in the Chinese Eastern Railway. For a time it was administered by an International Railway Committee and in 1924 as a result of treaties between the Soviets and the Chinese Government at Peking, as well as with Chang Tso-Lin's government in Manchuria, the railway was placed under joint Sino-Soviet management. The date of turn-over to the Chinese Government without charge was shortened by 20 years to 1963. Following the acquisition of Manchuria by Japan, Soviet Russia sold its interests in the Chinese Eastern Railway to Japan in March 1935 for a price of ¥ 170,000,000. The exchange rate of the Manchukuan yen and the American dollar at the time was about 4 to 1. Under this transaction the Japanese acquired 1732 kilometers of railway, which was turned over to the South Manchurian Railway.

By March 1939 the railway mileage of the South Manchurian Railway was reported to be over 10,000 kilometers. Of this length, 3,897 kilometers have been built since 1932. Japanese expenditures for railways in Manchuria during their first five years of occupation were reported to be 870,000,000 yen, an amount which was stated as being two-thirds the total sum of Japanese investments in Manchuria during the same period, war expenditures excluded. The amounts expended by the Japanese since 1938 on the South Manchurian Railway Company have not been ascertained at this time although it is presumed that they were substantially in excess of the first five year period, as the company

42 500 000 $
4 ) 170 000 000 M¥
16
10
8
20



115°
120°
Amur
U S S R
River
50°
Argun
Ssu
O U T E R
M O N G O L I A
Tu-lu-erh
Ch'o-lo
Pai-ch'eng-tzu
45°
C H A H A R
Shara
Ho
UNDER CONSTRUCTION
Lao-ha
Luan
Fou-hsin
Chuliuho
Hsin-li-t'un
Pei-p'iao
Su-chi
Yeh-pai-shou
I-hsien
Ta-hu-shan
Jehol
(Ch'êng-te)
Chinchow
(Chin-hsien)
Kou-pang-tzu
Liao-ya
Hu-lu-tao
Ying-k'ou
Ta-shih
40°
LIAO-TUNG WAN
Pei-p'ing
Ho
Tientsin
Ta-ku
PO-HAI WAN
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
120°

undertook extensive development in diversified fields of the Japanese war time economy. For a list of subsidiaries of the South Manchurian Railway Company see Appendix 6-A.

In the Sino-Soviet Railway agreement which is part of the Sino-Soviet Treaty of 14 August 1945, the main lines of Chinese Eastern and the South Manchurian Railways were combined to form the Chinese Changchun Railway. Under the agreement the new railway is to be a joint Sino-Soviet enterprise, in equal shares and not "alienable in whole or in part". The agreement is to run for 30 years at the end of which time the entire railway "with all its properties shall be transferred without compensation to the ownership of the Republic of China." One important clause of the agreement is "there shall be joint ownership and operation only of those lands acquired and railway auxiliary lines built by the Chinese Eastern Railway during the time of Russian and joint Sino-Soviet administration and by the South Manchurian Railway during the time of Russian Administration (note: prior to 1905) and which are designed for the direct needs of these railways as well as the subsidiary enterprises built during the said periods and directly serving these railways. All other railway branches, subsidiary enterprises and lands shall be in the complete ownership of the Chinese Government." An English copy of the Treaty and the accompanying notes will be found in Appendix 2.

In addition to the Sino-Soviet agreement on Railways, others, covering the port of Dairen, the Naval base at Port Arthur and the Kwantung Peninsula have been effected. Aside from the military and political benefits the Soviets gain, these agreements place them in a most favorable position for further economic penetration. Both the Chinese Eastern and the South Manchurian Railways have a long history of such activities.

So far the joint Sino-Soviet administration of the Chinese Changchun railway has had little opportunity to function, because of the Chinese Communists and the sad condition of the railways. Soviet actions in Manchuria during the occupation have not endeared them to the Chinese other than Communists, and friction in the management will be difficult to avoid.

The Northeast Economic Commission of the Chinese Government has provided the following information on the railway situation in Manchuria as it existed in July 1946:

| | | |
|---|---|---|
| Total length | 11,147 | kilometers |
| Chinese Changchun Railway (joint Sino-Soviet operation) | 2,522 | " |
| Belonging to Chinese entirely | 8,625 | " |
| Actually under control of Chinese Nationalist Government | 1,700 | " |
| Under control of others | 6,925 | " |

PORT OF HULUTAO - The use of Dairen being restricted by the USSR, Hulutao is the best available port in Manchuria. Japanese repatriates from Manchuria are all routed through this port.

Railroad cars being loaded direct from Liberty ships. Hulutao is on the Peking-Mukden Line.

As of August 15, 1946, the Chinese Nationalist Government had only about 900 kilometers of the Chinese Changchun Railway under control; this consists of part of the section south of the Sungari River. Chinese Communist armies are in control to the north. Thus it appears that the Chinese Nationalists have about 20 percent of Manchuria's railways actually under control.

The accompanying map shows principal railway lines in Manchuria.

The total capitalization of the South Manchurian Railway as of August 1945 was about ¥ 4,000,000,000. There is considerable conflicting information on the subject, due no doubt to the destruction of records and the wide variety of enterprises in which this corporation was engaged. The balance sheet for the corporation for the year 1939 is reproduced in Appendix 6-b. This balance sheet shows total assets of nearly ¥ 2,500,000,000 for that year. War time development probably increased assets to at least four billion yen by 1945. For further information on this subject see Source File 201-X-10. For further information concerning subsidiaries of the South Manchurian Railway Company, refer to Appendix 6-b, and Source File 201-X-8.

## Effects of Soviet Occupation.

Since the Chinese Nationalist Government had only about 20 percent of Manchuria's railways under control, the Pauley Mission had limited opportunities to investigate railway conditions, although during their visit to Harbin and Mutanchiang some installations not under the control of the Chinese Nationalist Government were observed.

It is obvious, however, that the railway installations in Manchuria suffered substantial losses as a result of Soviet occupation and the civil war. There is a very marked shortage of railway rolling stock, and a number of the repair shops visited by the Pauley Mission indicated that there had been large scale removals of plant equipment from railway installations. A study of railway equipment removals has been undertaken by the Northeast Economic Commission and their findings will be found in Source File 201-X-11. The following tabulation of figures showing removals by the Soviet Army is taken from this file:

### MILEAGE OF RAILS REMOVED BY SOVIET ARMY

| Section | Length of rails removed |
|---|---|
| Ningnien - Shenwutun | 456 kilometers |
| Peian - Heiho | 303 " |
| Linkou - Hutou | 336 " |
| Lafa - Harbin | 274 " |
| Tawa - Hopei | 37 " |
| Suchiatun - Antung | 260 " |
| TOTAL | 1,666 kilometers |

## LOCOMOTIVES AND ROLLING STOCK

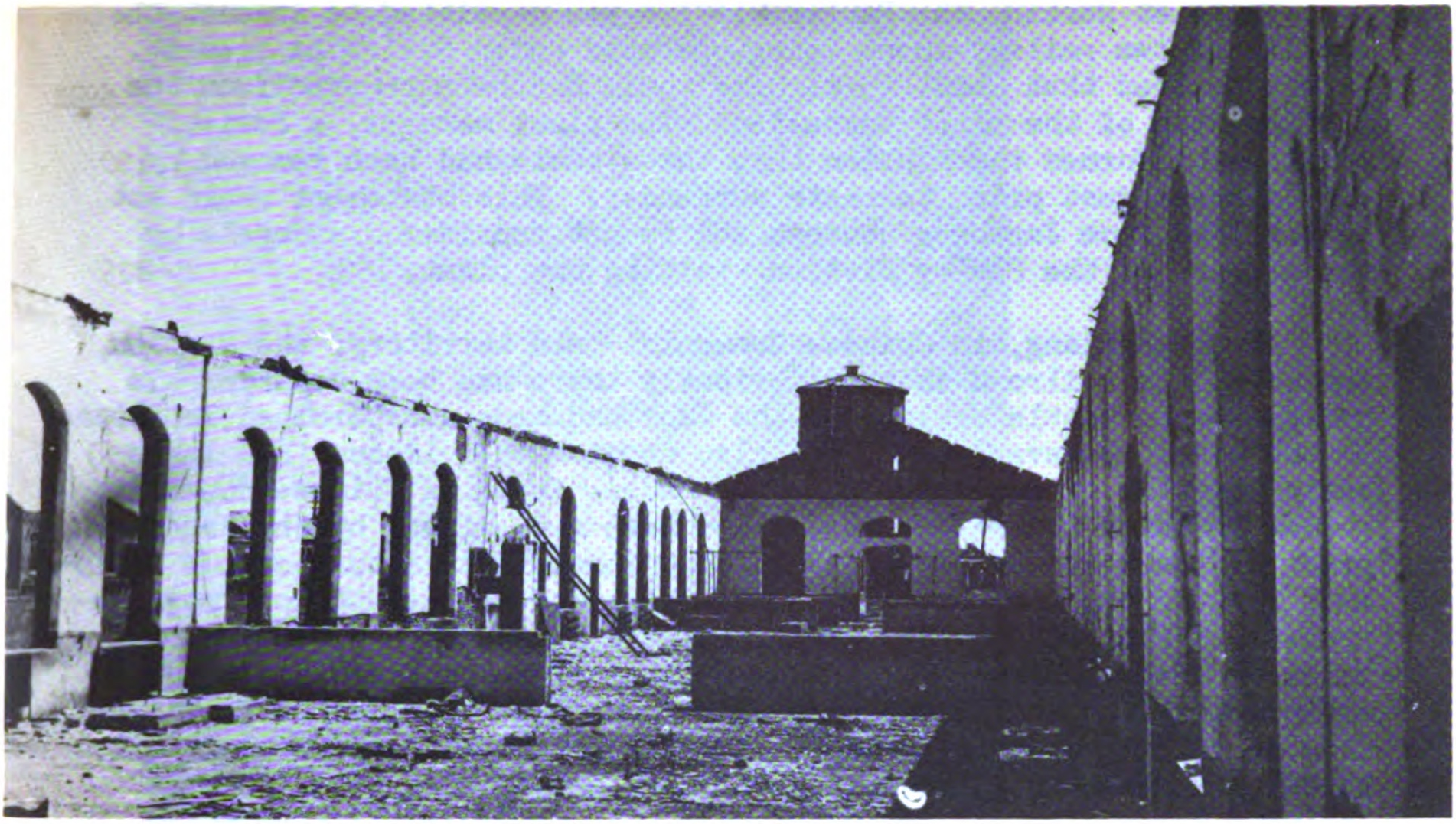
| Item No. | Condition | Locos. | Pass. Cars | Frt. Wagons |
|---|---|---|---|---|
| (1) | Prior to Aug. 1945 | 2,130 | 3,027 | 30,450 |
| (2) | To date taken over by National Government | 161 | 190 | 805 |
| (3) | Operable ones in (2) | 63 | 90 | 714 |
| (4) | Apparent loss, (1)-(2) | 1,969<br>(92.4%) | 2,837<br>(93.7%) | 29,645<br>(97.3%) |
| (5) | Actual loss (1)-(3) | 2,067<br>(97%) | 2,937<br>(97%) | 29,736<br>(97.6%) |

Obviously the railways played a major part in the removal of plant equipment from Manchuria, and it is entirely possible that some of the missing rolling stock may be located on portions of the railway not under the control of the Chinese Nationalist Government at present. From Japanese sources we obtained information that a nominal amount of Manchurian Railway equipment had been altered to accommodate the broad Russian railway gauge. However, the extent of such alterations has not been determined as yet by Chinese Nationalist officials. Members of the Pauley Mission observed no evidence that the Soviets had broadened the gauge of the tracks of the northern section of the Chinese Changchun Railway to the Russian standard, in spite of reports to this effect.

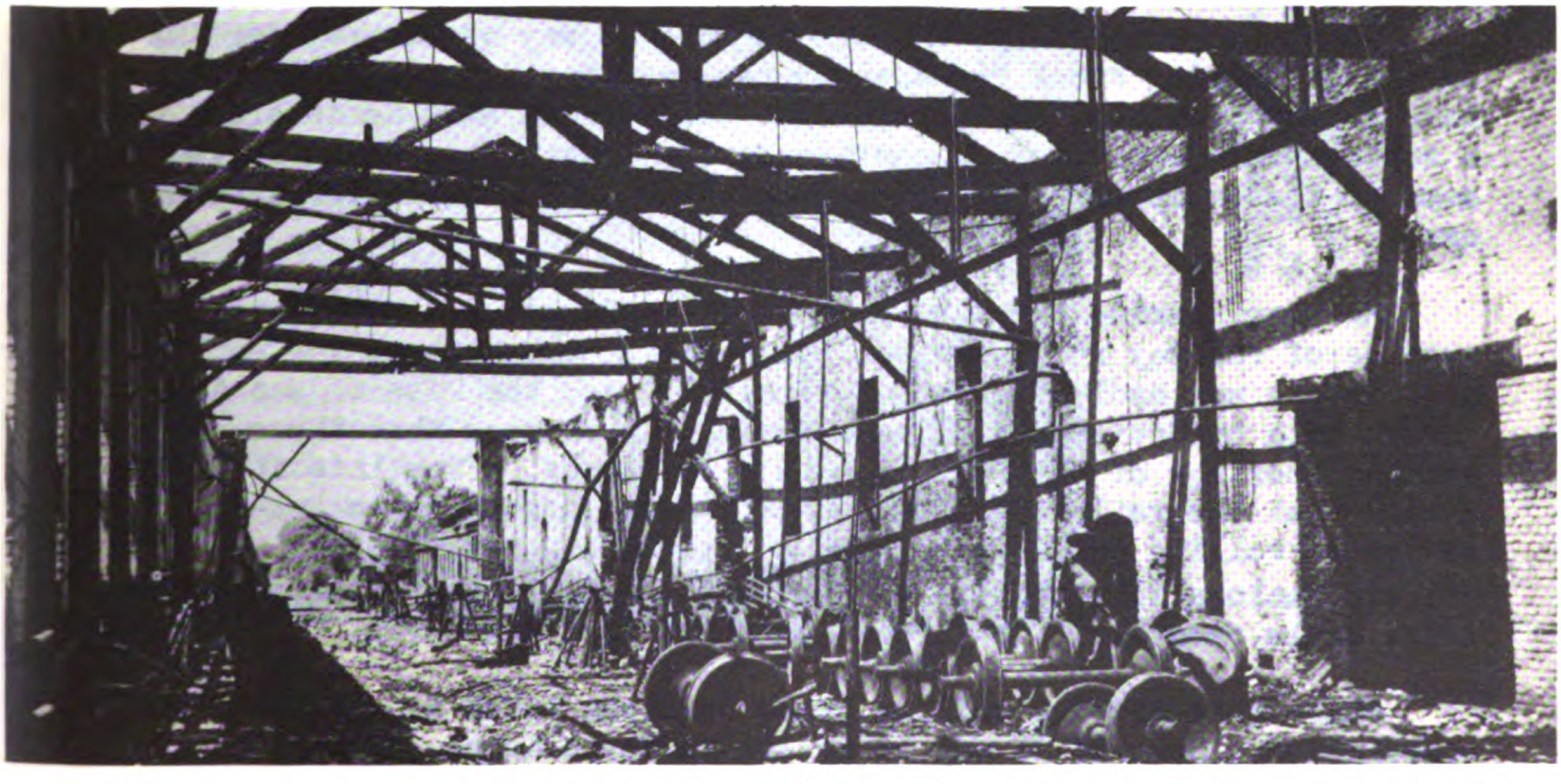
The railway repair shops at Mukden, in which the Soviets have a half interest, are apparently in normal operating order except for the fact that insufficient power is available. On the other hand, at Changchun large scale removals of equipment had been made. The stripping of the railway shops here was completed by October 25, 1945, according to Japanese present at the time. For further information see Plant Inspection Report 8-N-1 in Appendix 6.

Also at Changchun the Pauley Mission found that the Nippon Air Brake Company had been stripped at the same time as the railroad shops. The equipment in this plant was in the process of installation, having been removed from Japan. According to Japanese sources, there was over $3,000,000 worth of machine tools and plant equipment taken from this plant alone by the Soviets. For further details concerning this plant refer to Plant Inspection Report 8-N-2 in Appendix 6.

The railway shops at Kirin were also thoroughly stripped. For further information see Source File 9-N-1.



**RAILWAY SHOPS AT CHANGCHUN** - Battery and plumbing shop from which the Soviets removed all the tools and equipment.



**CAR REPAIR SHOP** - The Soviets made practically a complete removal of machinery, tools and equipment from all the shops of this plant.

While at Harbin, the Pauley Mission was permitted to inspect the smaller of two railway shops being operated under Soviet management. It was noticed that about 25 machine tools had been removed from the machine shop of the plant inspected. The plant manager, a Soviet civilian, informed the Mission that these tools had been removed by the Japanese just prior to their surrender. This statement could not be verified from Japanese sources and is not considered accurate by the members of the Pauley Mission visiting the plant.

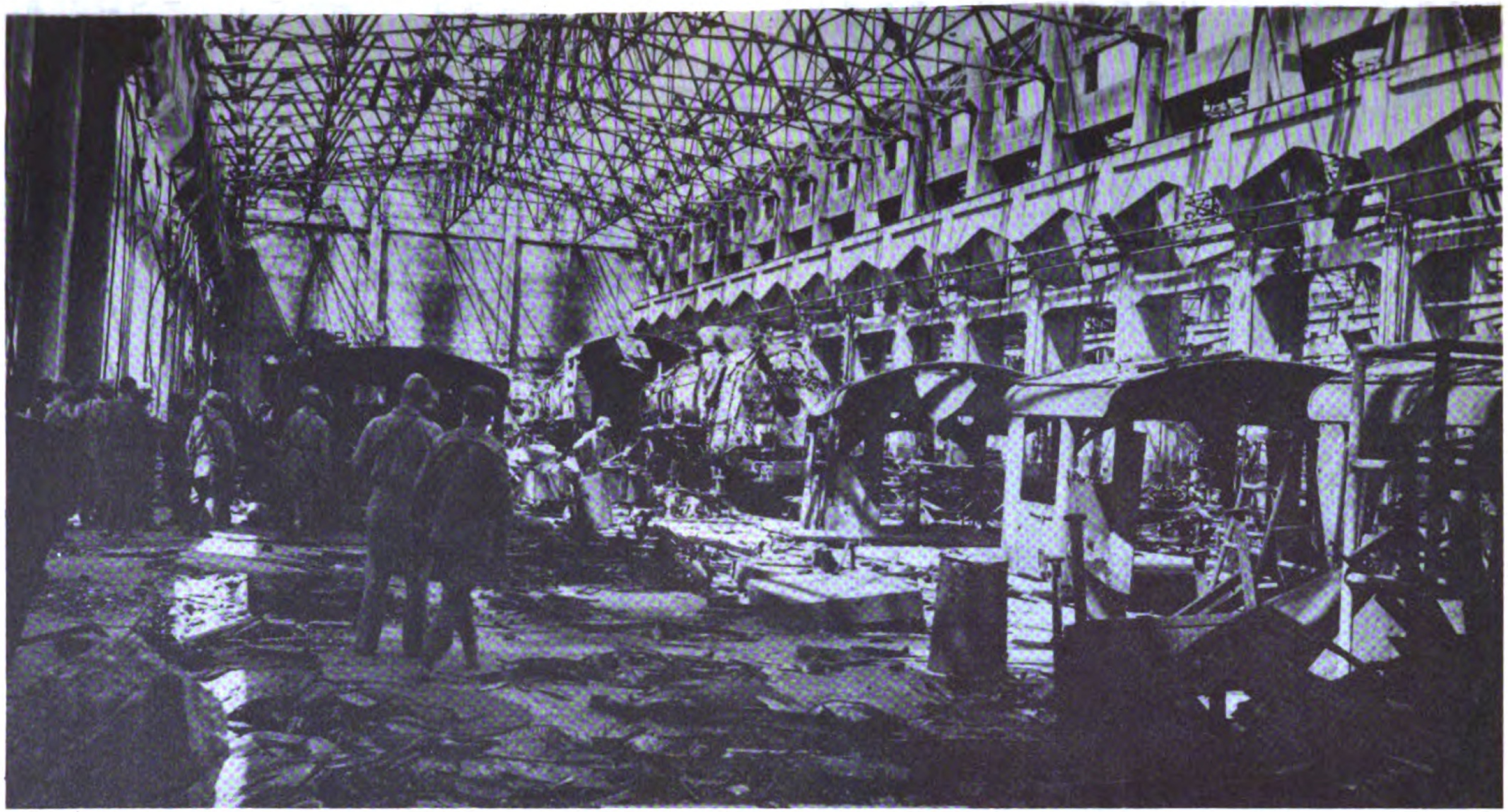
At Mutanchiang, in Chinese Communist-held territory, the Mission inspected the railroad shops. Obviously there had been considerable damage due to battle action, as the Japs had made a determined resistance in the area. However, there was also conclusive evidence that large scale removals of equipment had been made. Here the Chinese Communist guides insisted that all removals had been made either by the Japanese prior to their evacuation or by local Chinese. The nature of the equipment removed was such as to make both of these representations most improbable. Japanese sources stated that no equipment had been removed prior to their evacuation. There was no logical destination for such equipment as far as the Japanese were concerned. For further information on railway shops at Mutanchiang refer to Plant Inspection Report 13-N-1, in Appendix 6, and Harbin-Mutanchiang Special Report 2-b in Appendix 2.

Based on observations made by the Pauley Mission, it seems probable that the full amount of removals and damages resulting from Soviet occupation to railway maintenance and repair facilities amounted to approximately $25,000,000 for all of Manchuria.

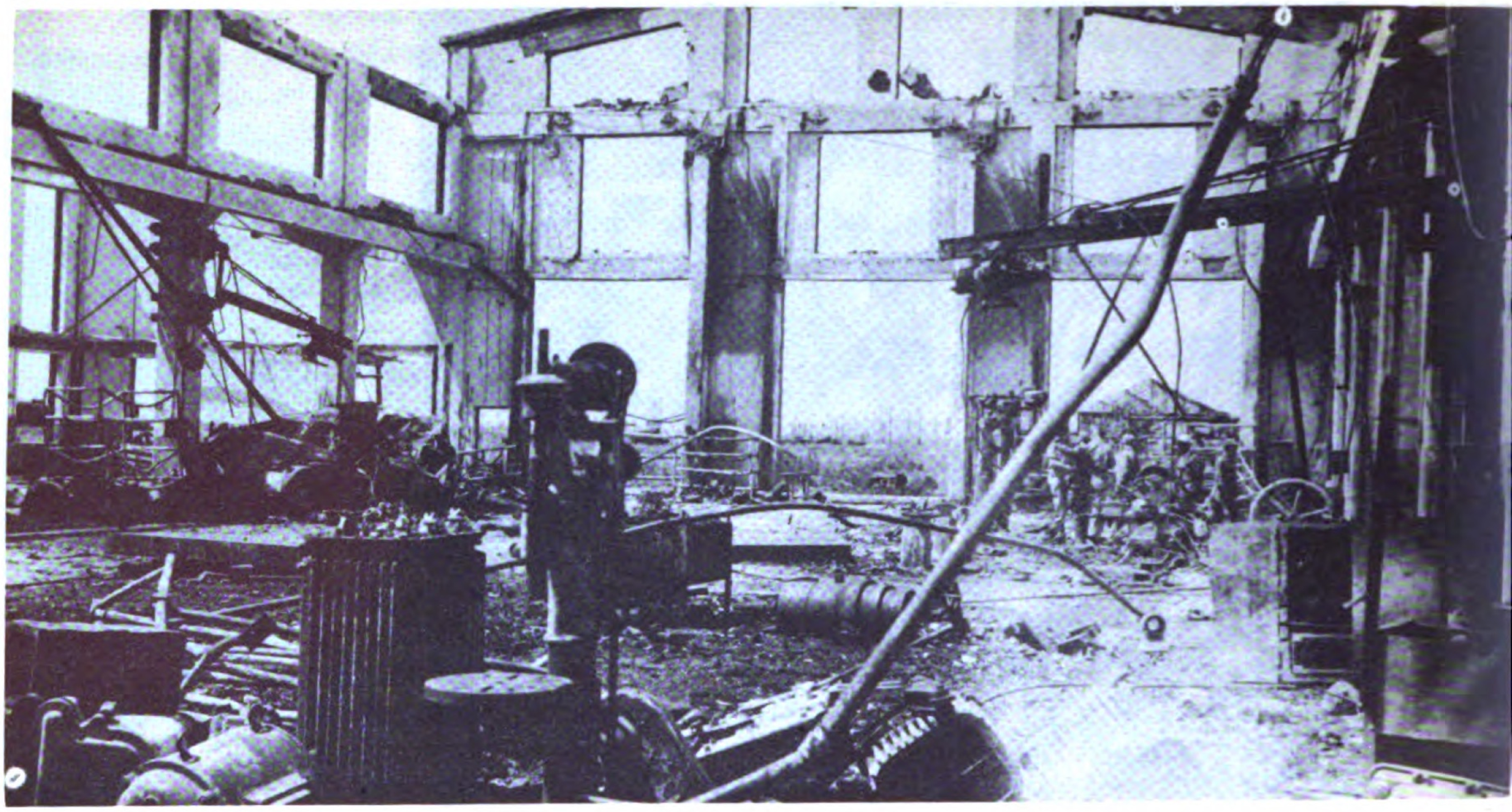
As stated previously, the Mission had no way of determining the amount of rolling stock permanently removed from Manchuria. It would have seemed probable that inasmuch as the Soviets have an interest in a substantial portion of Manchurian railways that they would leave some of the equipment, now unaccounted for, in Manchuria for future use.

However, during the Mission's visit to Harbin and Mutanchiang, no surplus of railway rolling stock was observed and much of the equipment in use was badly in need of repair. Also, the Mission was informed both by Soviet and Chinese Communists sources that there was a serious shortage of rolling stock in these areas. From this it would appear that the railroads in Communists areas are no better equipped, as far as rolling stock is concerned, than the Manchurian railroads in Chinese Nationalists' hands; and it seems probable that there has been large scale removals of railroad equipment from Manchuria.

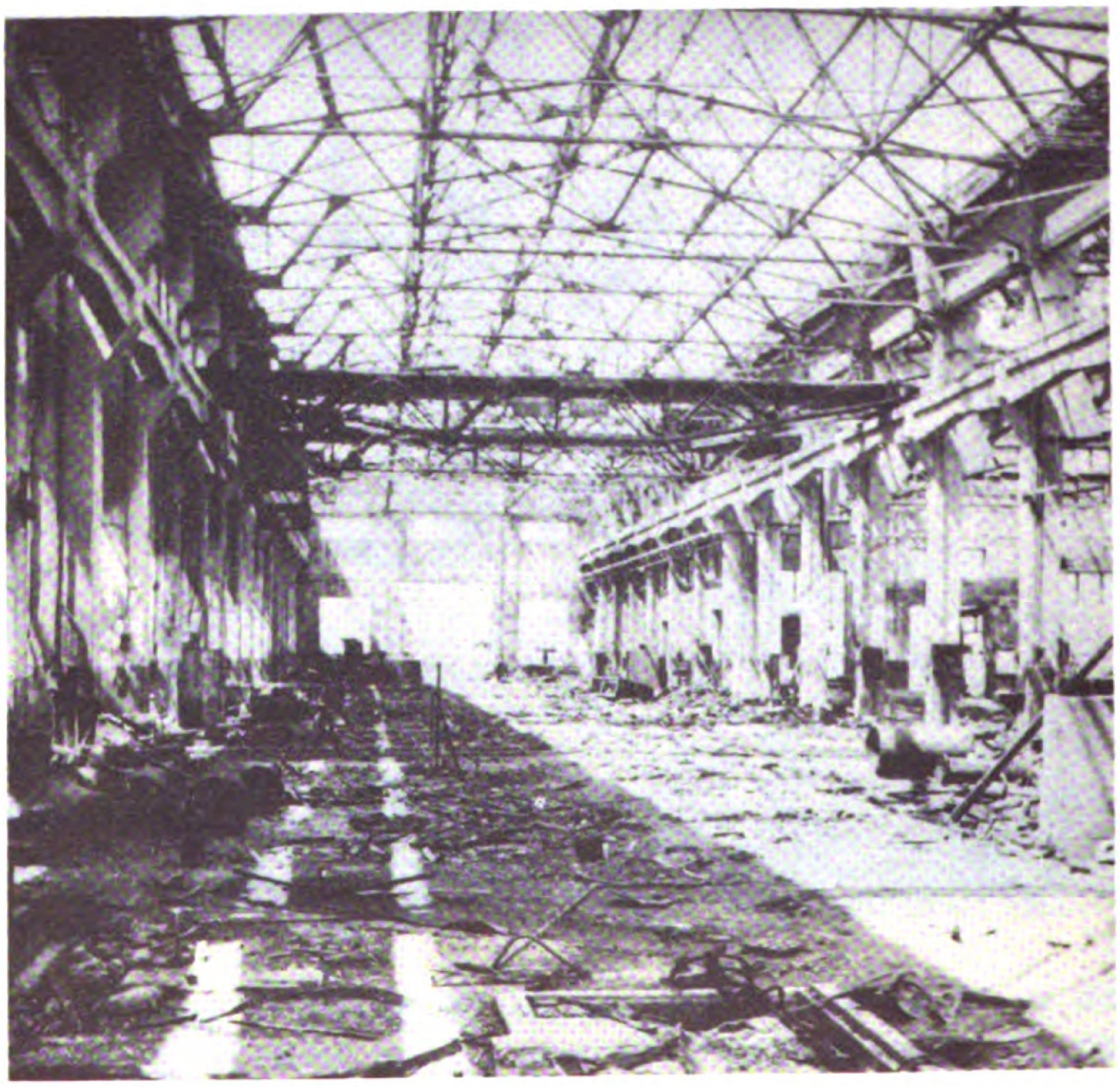
Where this missing rolling stock has been taken is a subject for speculation. Some of it may be in use in North Korea. A part may be in the Dairen area. Also in view of the large scale and rapid removals of heavy equipment and stores from Manchuria, a part of this material



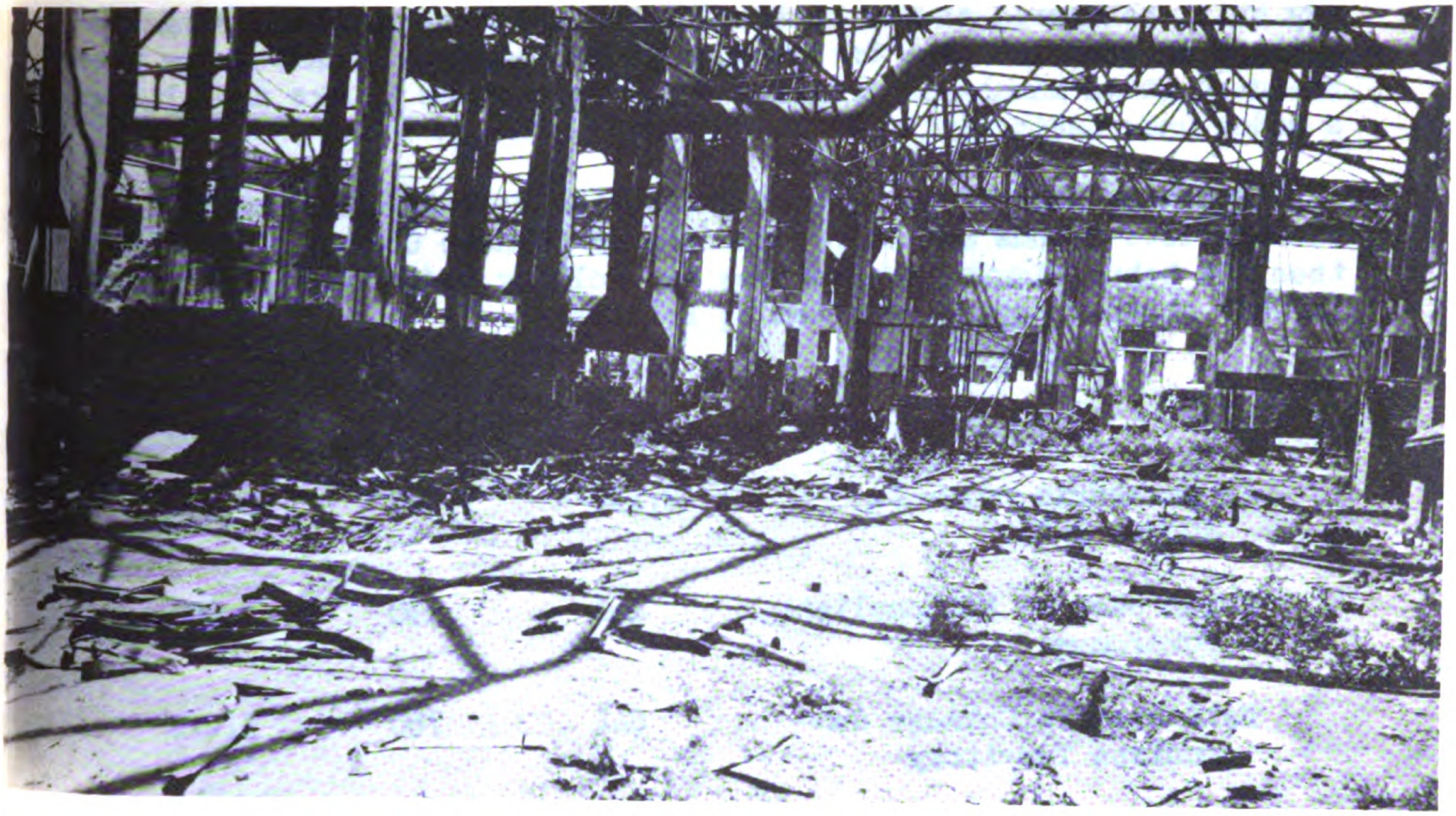
Railway Shop at Mutanchiang---about 200 miles southeast of Harbin---showing fire damage probably resulting from battle action although very few damaged machine tools or electric motors are in place.



Railway Shops at Mutanchiang in Chinese Communist-held area showing evidence of fire and battle damage to machine tools and electrical equipment.



Mutanchiang heavy machine shop with all machine tools and electrical equipment removed. Chinese Communists claimed all removals here as well as at other points visited by Pauley Mission in Communist territory, were made by Japanese or Chinese, but Mission discounts this claim.



ABOVE. Forge Shop in Railway Shops at Mutanchiang showing all machine tools removed, also fire damage and destruction. Foundations for eight steam hammers were noted in this shop, also evidence that fire had occurred after tools had been removed.

LEFT. Upright castings for large steam hammer outside forge shop. These were only remnants noted of forge shop equipment.

may still be stored on the rolling stock in temporary standard gauge sidings in Siberia. The Soviet wide gauge railways cannot carry the standard gauge Manchurian rolling stock unless the trucks are altered—a major undertaking.

Assuming that 20 percent of Manchurian Railways are now in Nationalists' hands and 80 percent are in Chinese Communists' hands, then the tabulation of Locomotives and Rolling Stock appearing earlier in this chapter may be modified as follows:

| | Locos. | Passenger Cars | Freight Wagons |
|---|---|---|---|
| In Manchuria prior to August 1945 | 2,130 | 3,027 | 30,450 |
| Taken over by Nationalists Government | 161 | 190 | 805 |
| Estimated in Chinese Communists Territory | 644 | 760 | 3,220 |
| Estimated number of removals by Soviets | 1,486 | 2,267 | 27,230 |

It is estimated that the replacement cost of this equipment in Manchuria would be not less than $45,000 for each locomotive; $25,000 for each passenger car and $1500 for each freight wagon. Thus the total value of railway stock removals totals as follows:

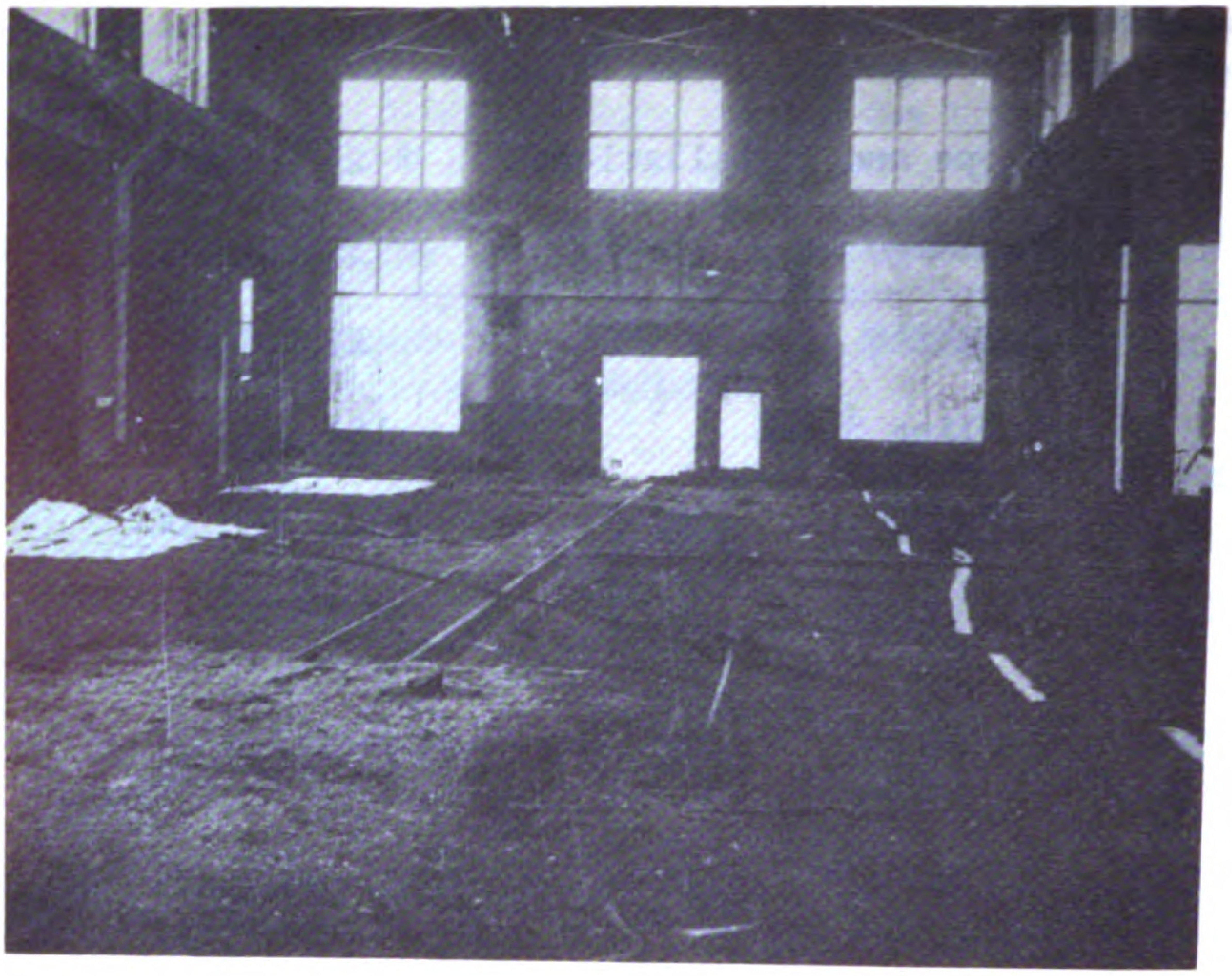
| | |
|---|---|
| Locomotives | $66,870,000 |
| Passenger cars | $56,675,000 |
| Freight Wagons | $40,845,000 |
| TOTAL | $164,390,000 |

If the Chinese Nationalists are correct in their information that the Soviets have removed approximately 1700 kilometers of railway in Northern Manchuria, this represents a loss of about $17,000,000. If bridges, tunnels and other installations along these lines have been destroyed this amount may be doubled.

The estimate of total loss suffered by Manchurian Railways as a result of Soviet occupation is as follows:

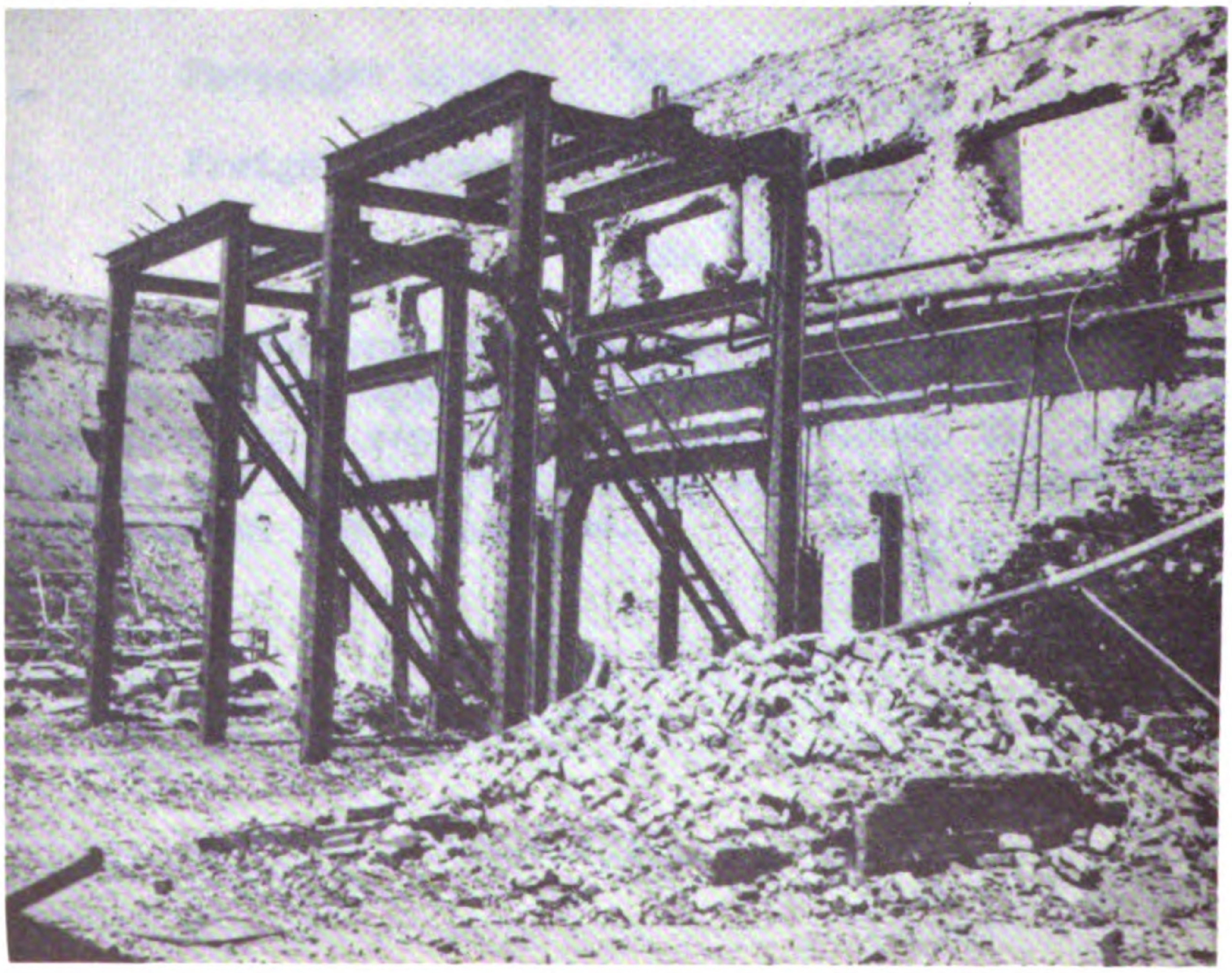
| | | |
|---|---|---|
| Shops and Installations | - | $ 25,000,000 |
| Trackage | - | 17,000,000 |
| Supplies | - | 15,000,000 |
| Rolling Stock | - | 164,390,000 |
| TOTAL | | $221,390,000 |

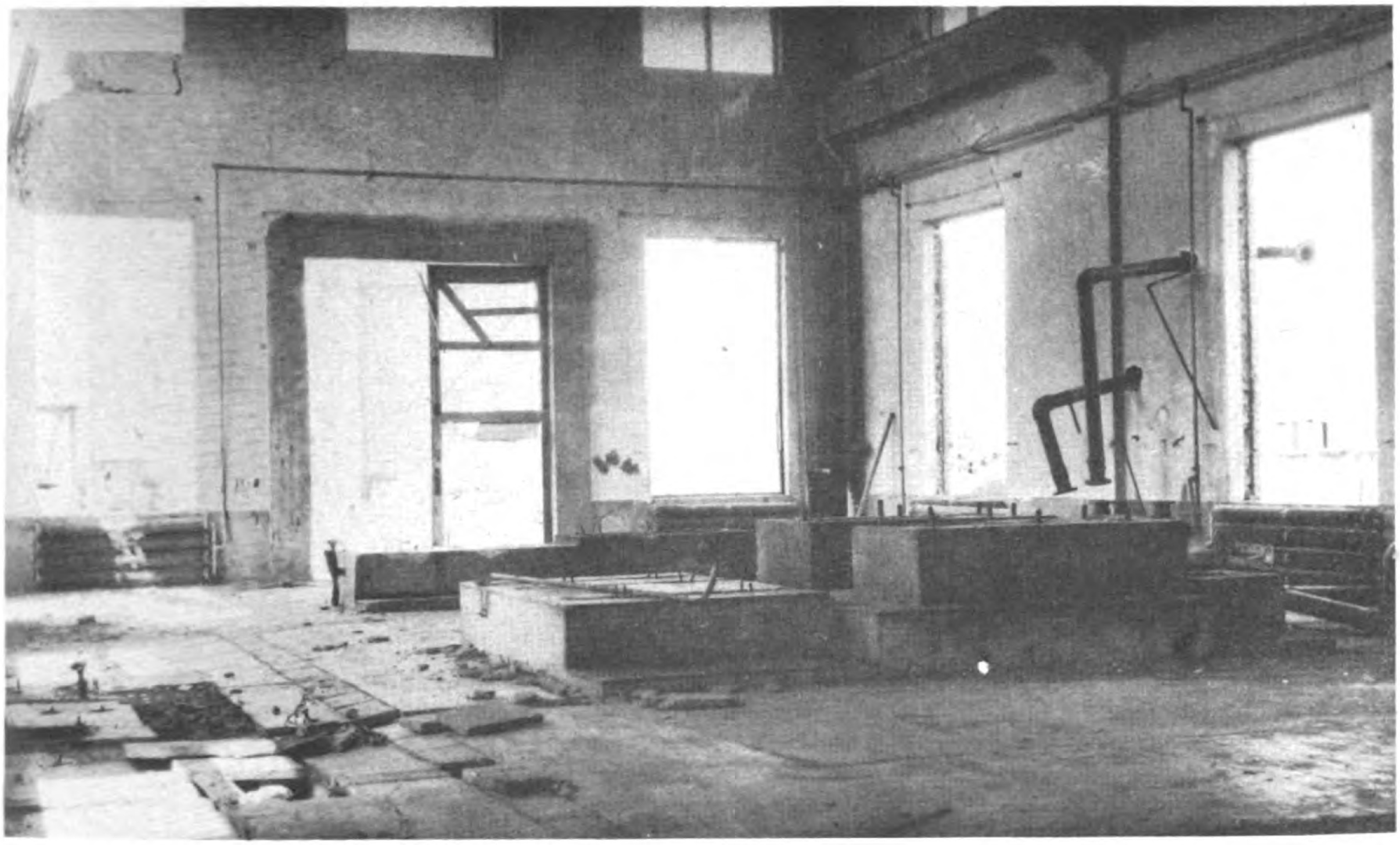
$45 000 Soviet removal, locos.
1486
270000
360000
180000
45000
$66,870,000 etc.



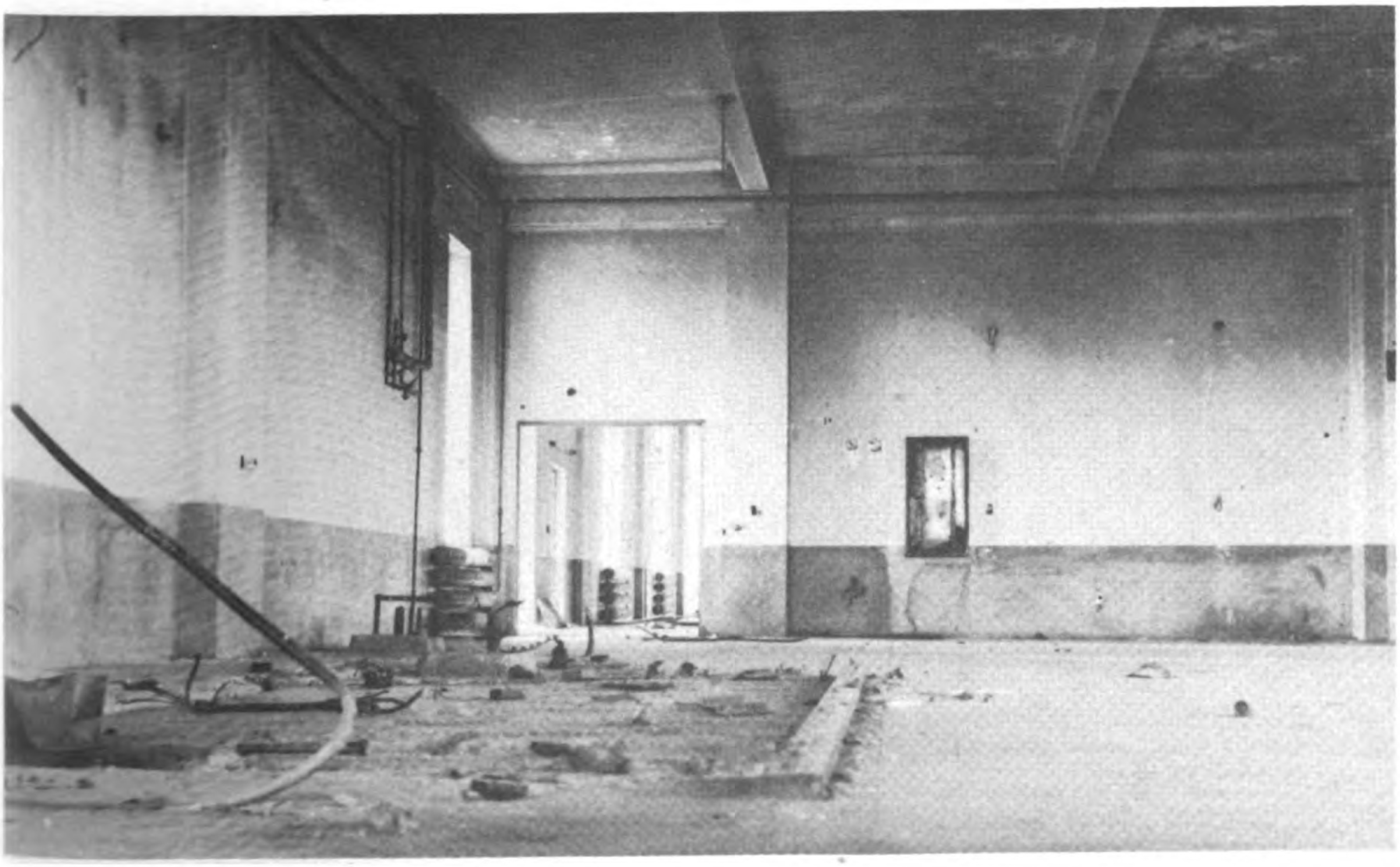
**ABOVE.** Mutanchiang--Interior of Railway Shops Foundry. All equipment removed--no evidence of fire or battle damage.

**BELOW.** Boiler House--Boilers removed--extensive damage to boiler house.





**MUTANCHIANG RAILWAY SHOPS** - Electric generator foundations above, and control panel foundations below. Evidence indicates that the Soviets removed this equipment.



# CHAPTER VII

## METAL WORKING INDUSTRY

### A. HISTORY OF THE INDUSTRY

The development of the metal working industries in Manchuria essentially had its advent with the creation of the state of Manchukuo in 1934. Prior to that date what little use of metal working machinery was made was largely connected with the maintenance and repair activities of the South Manchurian Railway Company and the activities of the Manchuria Industrial Development Corporation, which was organized in 1912 as a government formed enterprise and reorganized in 1937 with a fully paid up capitalization of four hundred and fifty million yen (¥ 450,000,000) of which ¥ 225,000,000 was held up by the Manchukuo Government and ¥ 225,000,000 was owned by the General Public. As set forth in the articles of the company, the purpose of the Manchuria Industrial Corporation was to "invest in any or all of the following industries and direct the management thereof".

1. Iron and Steel Industry
2. Light Metal Industry
3. Automobile Manufacturing Industry
4. Aircraft Manufacturing Industry
5. Coal Mining Industry

In 1933 the Anshan Iron Works which had been operated by the South Manchurian Railway Company decided upon the manufacture of steel and management was transferred to the Showa Steel Works, Ltd., a Japanese corporation, later to become part of the Manchuria Industrial Development Corporation and in 1939 it was set up as a special corporation under the laws of Manchukuo.

Likewise by special act of the Manchukuo government the Dowa Automobile Company, Ltd., was formed in 1934 with the "object of controlling and developing" the automobile industry in Manchukuo. In 1939 the capital of Dowa Automobile was set at ¥ 30,000,000.

The above traces briefly the development of a few of the earlier companies operating in Manchuria who are users of metal working machinery and machine tools either in connection with the manufacture of metal products or the repair and maintenance of industrial equipment and are typical of the changes that brought these industries under full Japanese control.

The majority of the companies using machine tools in connection with their manufacturing methods came into being in 1935 and the years following, first as part of the plan of the Japanese government for the industrialization of Manchuria and the prosecution of the Sino-Japanese war and later as a source of military material for carrying on World War II in the Pacific and in Asia.

## B. GEOGRAPHICAL DISTRIBUTION

Naturally the metal working industry developed in the localities producing the basic materials such as iron, steel, magnesium, aluminum and the copper alloys and those centers favored with a market and transportation facilities. Reference to the accompanying map will show that the greatest concentration of machine tools and metal making equipment was in the Mukden area and the district of Anshan with some industries in Harbin, Changchun, Antung, Wanfangtien, Chinchow and Dairen. Actual inspections by the Pauley Mission were made of the major installations at Mukden, Anshan, Harbin and Changchun. Information regarding plants and removals in those districts not visited was obtained from former Japanese officials of the plants concerned.

## C. NUMBER OF PLANTS

In the localities mentioned the number of plants using machine tools and metal working equipment was as follows:

| | |
|---|---|
| Mukden | 30 |
| Anshan | 10 |
| Harbin | 4 |
| Changchun | 2 |
| Antung | 1 |
| Wanfangtien | 1 |
| Chinchow | 1 |
| Dairen | 6 |

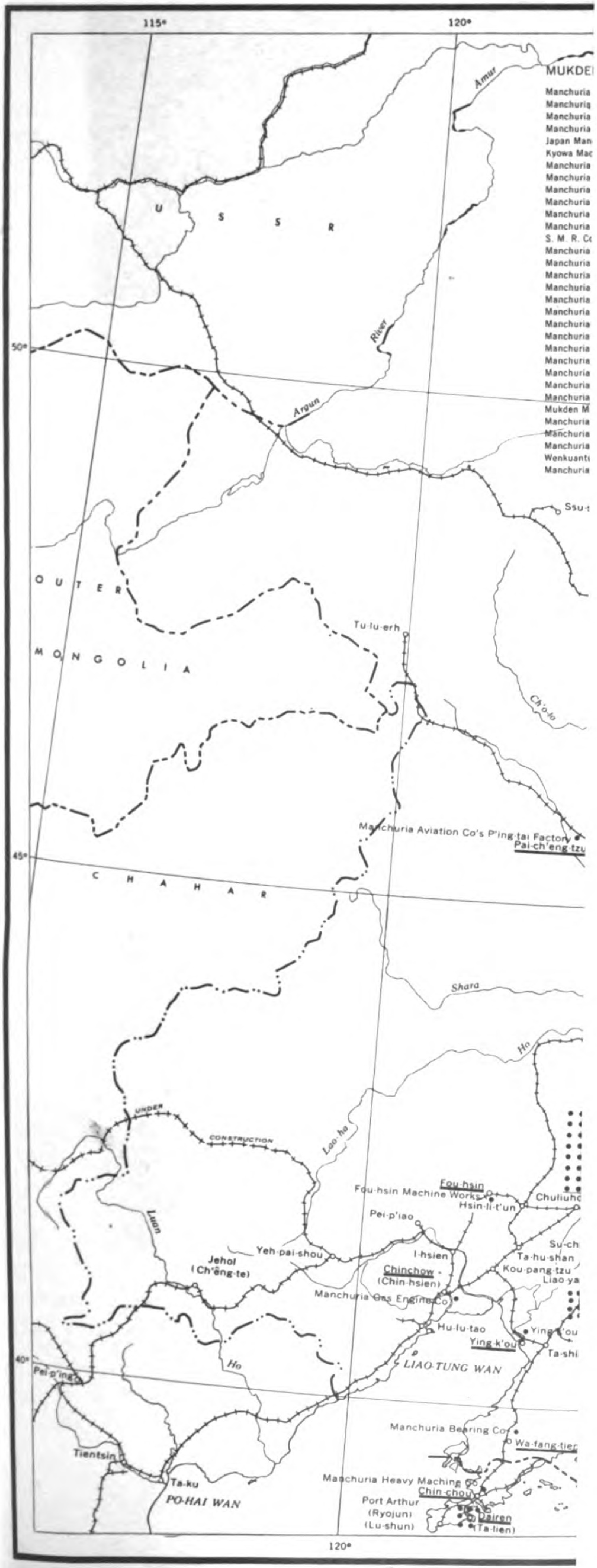
Installations at various other points for the most part were in railway repair shops. The districts mentioned contained well over 90 per cent of machine tools and metal working equipment installed in Manchuria.

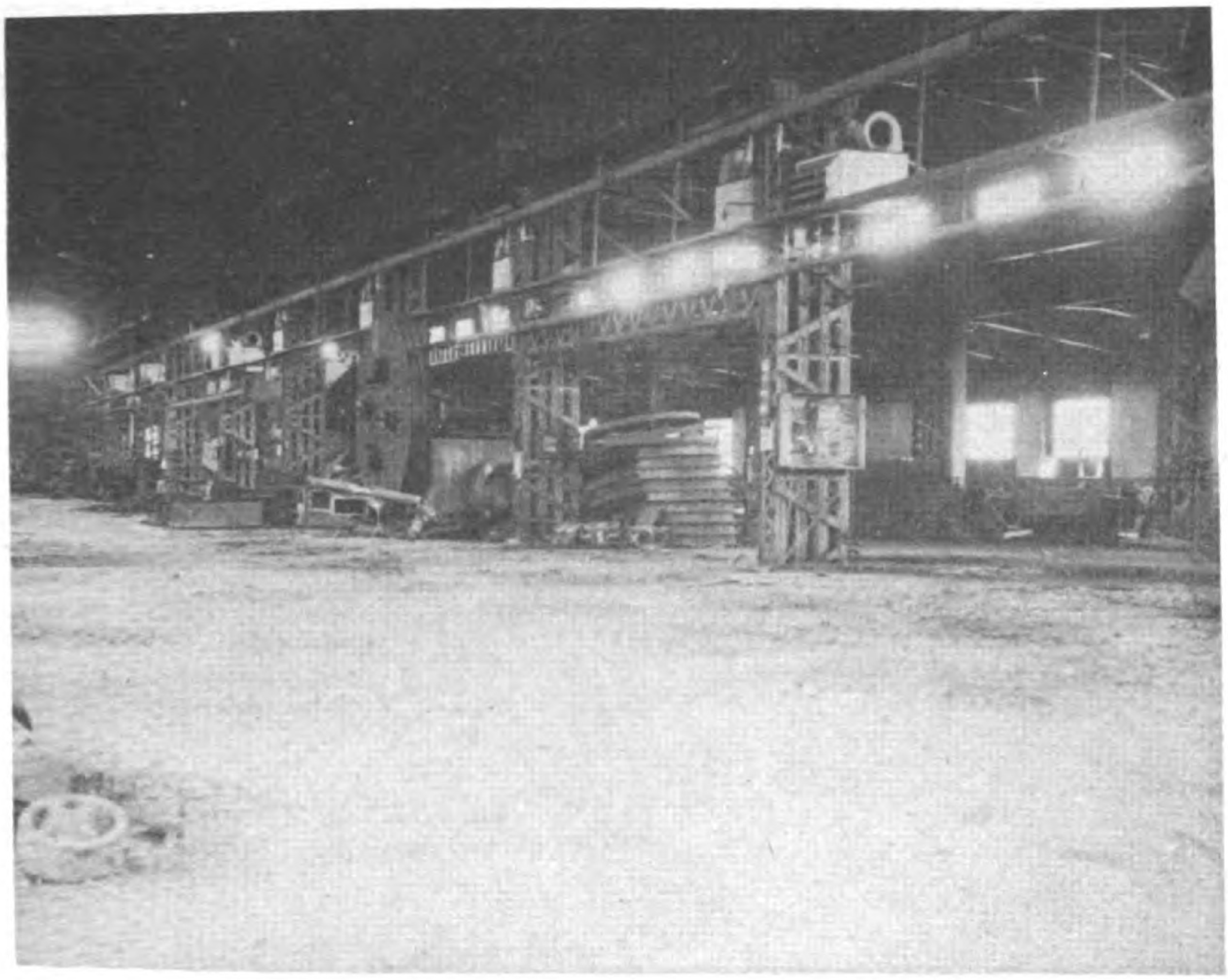
With the exception of a few plants in the Chinese Communist controlled Harbin district and some in the Soviet controlled Kwantung Peninsula, the majority of the plants both in number and capacity were in Nationalist territory at the time of the inspections.

Removals during Soviet occupation took place generally during the period from August 28, 1945 to December 1, 1945. However in the case of the Mukden Arsenal a second batch of machinery was removed in the period about January 1 to March 1, 1946.

Considering only the removals from the metal working industry, the Mission's observations and figures available from Chinese and Japanese sources indicate that a reasonable estimate of the machine tools and metal working equipment removed from Manchuria during Soviet occupancy is as follows:

Number of machines removed: 14,500 units
Dollar value of machines removed: $58,000,000
Weight of machines removed: 100,000 metric tons
Reduction in capacity: 80 per cent

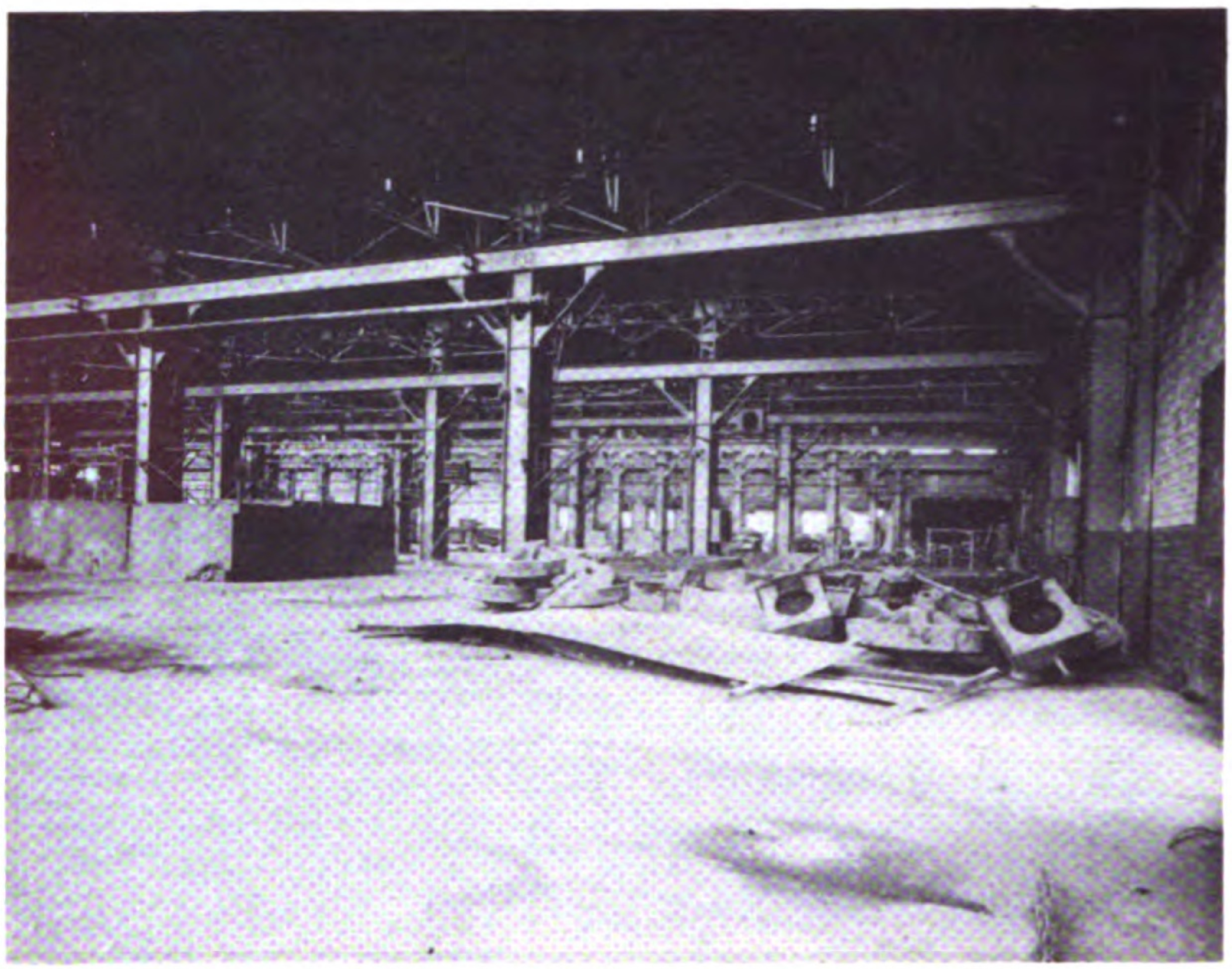

115°
120°
Amur
MUKDE
Manchuria
Manchuria
Manchuria
Manchuria
Japan Man
Kyowa Mac
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
S. M. R. Co
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
Manchuria
Mukden M
Manchuria
Manchuria
Manchuria
Wenkuant
Manchuria
U S S R
River
Argun
50°
Ssu-
OUTER
MONGOLIA
Tu-lu-erh
Ch'o-lo
Manchuria Aviation Co's P'ing-tai Factory
Pai-ch'eng-tzu
45°
CHAHAR
Shara
Ho
UNDER CONSTRUCTION
Lao-ha
Fou-hsin
Fou-hsin Machine Works
Hsin-li-t'un
Chuliuho
Pei-p'iao
Luan
Su-ch
Yeh-pai-shou
I-hsien
Ta-hu-shan
Jehol
(Ch'eng-te)
Chinchow
(Chin-hsien)
Kou-pang-tzu
Liao-ya
Manchuria Gas Engine Co
Hu-lu-tao
Ying-k'ou
Ying-k'ou
Ta-shi
Ho
LIAO-TUNG WAN
40°
Pei-p'ing
Manchuria Bearing Co
Wa-fang-tien
Tientsin
Manchuria Heavy Machine Co
Chin-chou
Ta-ku
PO-HAI WAN
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
120°



Mitsubishi Heavy Industries - Mukden

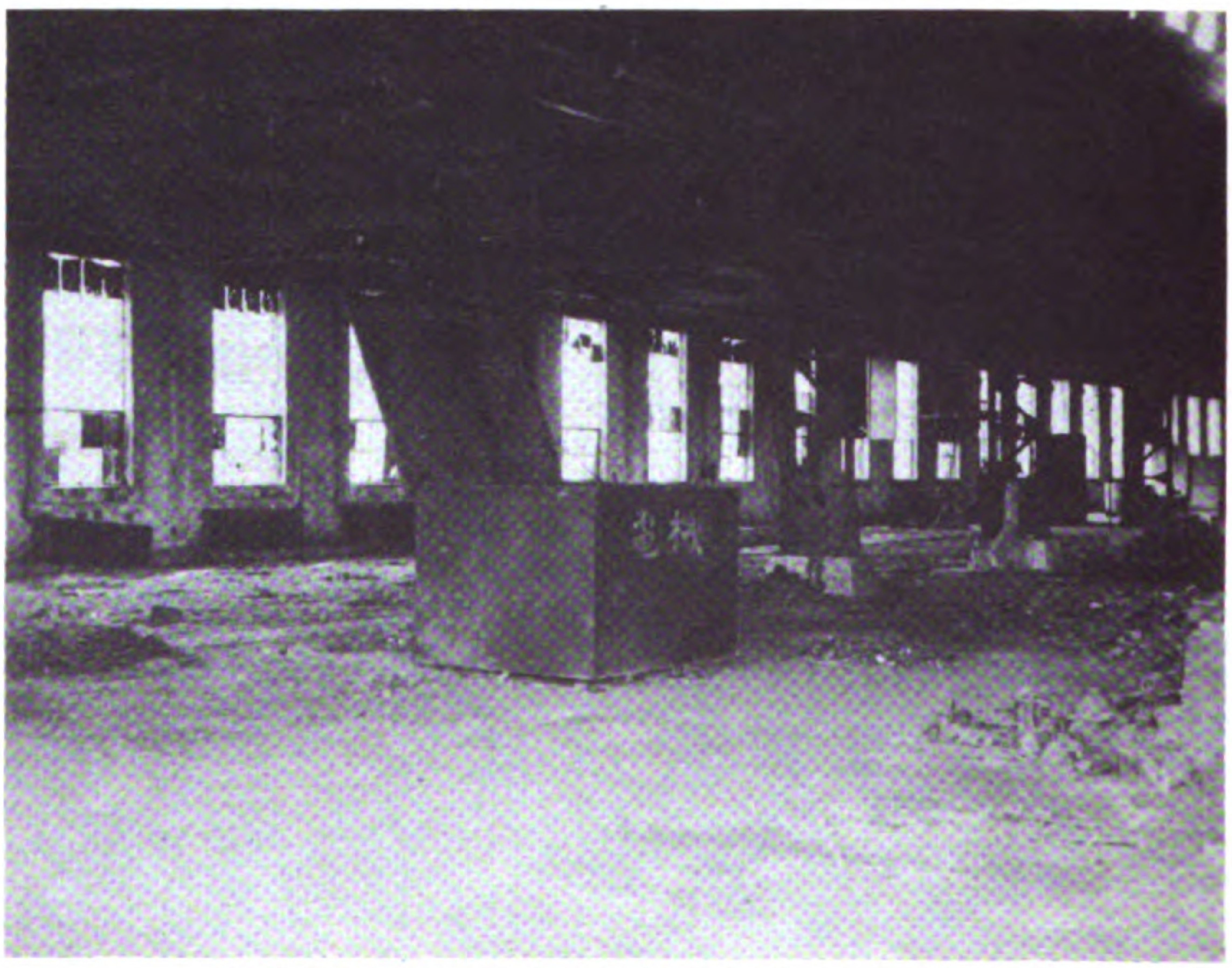
Heavy machine shops completely stripped of all machine tools except large face lathe.

Machine shop from which all machine tools, seven cranes and all motors were removed by Soviets.



MITSUBISHI HEAVY INDUSTRIES, MUKDEN

One of the machine shops from which all machine tools and seven overhead traveling cranes were removed.



MITSUBISHI HEAVY INDUSTRIES, MUKDEN

Truck and automobile type spring manufacturing plant from which most of the machinery including overhead cranes had been removed.

Actually, as shown in the tabulation chart, Appendix 7-a, the machine units removed for which a definite accounting can be made from plant records number 10,768. This represents only about 75 per cent of the plants known to exist, hence the round figure of 14,500 units. The dollar value estimate is based on a value of about $4,000.00 per unit which is considered reasonable as the Soviets selected the newer and more modern equipment for removal in preference to the old.

In addition removals also occurred from plants which were largely used for maintenance and repair such as railroad repair shops, for example:

Changchun shops, South Manchurian Railroad; 66 machines removed, value $220,000, reduction capacity 88 per cent. (See Plant Inspection Report 8-N-1 in Appendix 6.)

Kirin shops, South Manchurian Railroad; 139 machines removed, value $1,040,000, reduction in capacity 77 per cent.

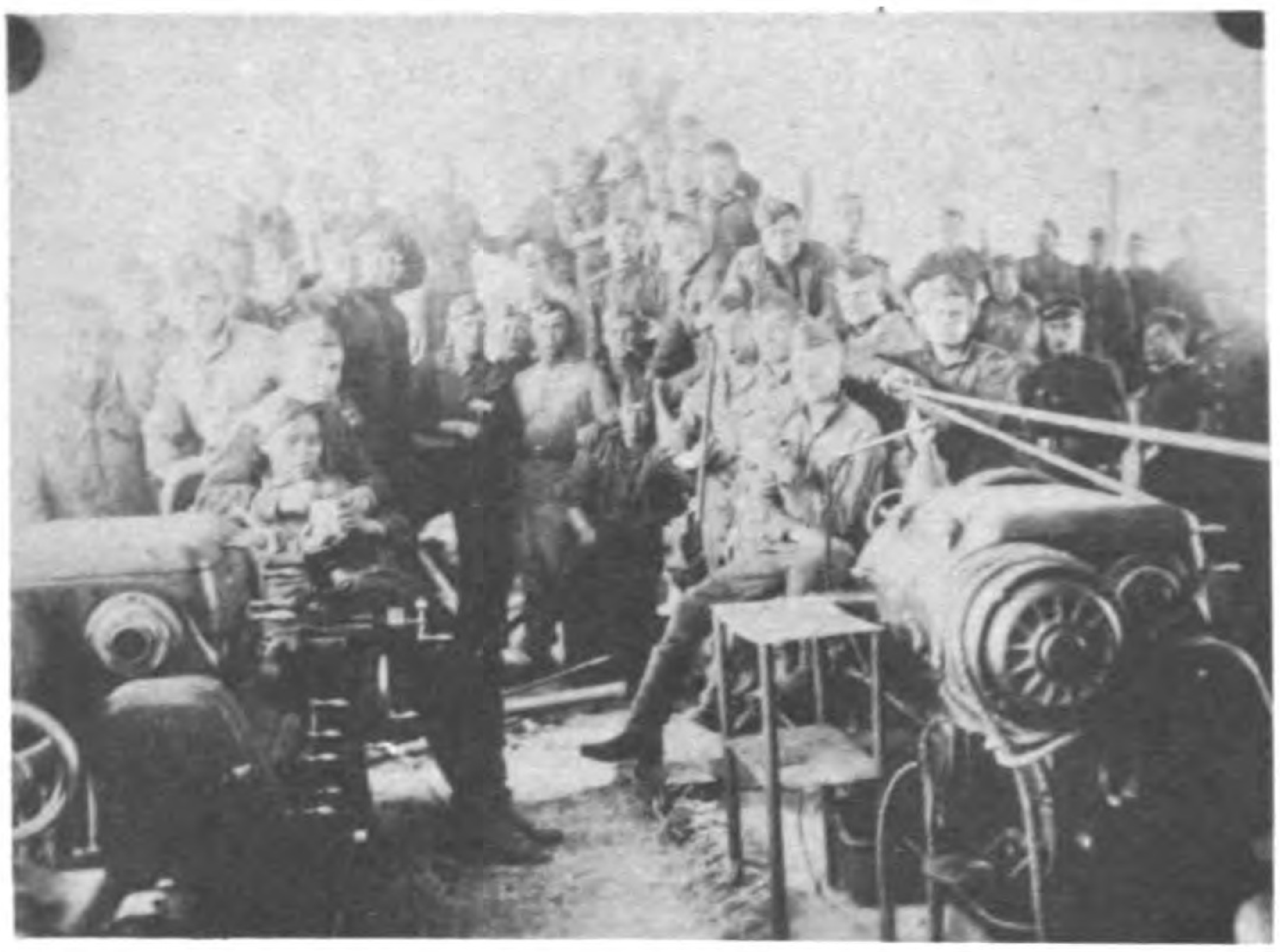
Nippon Air Brake Company, Changchun; 136 machines removed, value $2,500,000, reduction in capacity 100 per cent. (See Plant Inspection Report 8-N-2 in Appendix 6.)

These removals from railroad shops have been included in the estimate of removals in the railroad industry and therefore are not included in the totals in this Chapter.

It will be appreciated that in the case of the removal of equipment from plants engaged in the manufacture of metal goods, industrial machinery, machine tools, railway equipment, locomotives, rolling stock, automobiles, aircraft, arms, ammunition, etc., the capacity of the plant to produce is reduced immediately or completely curtailed by the removal of critical equipment either in part or as a whole.

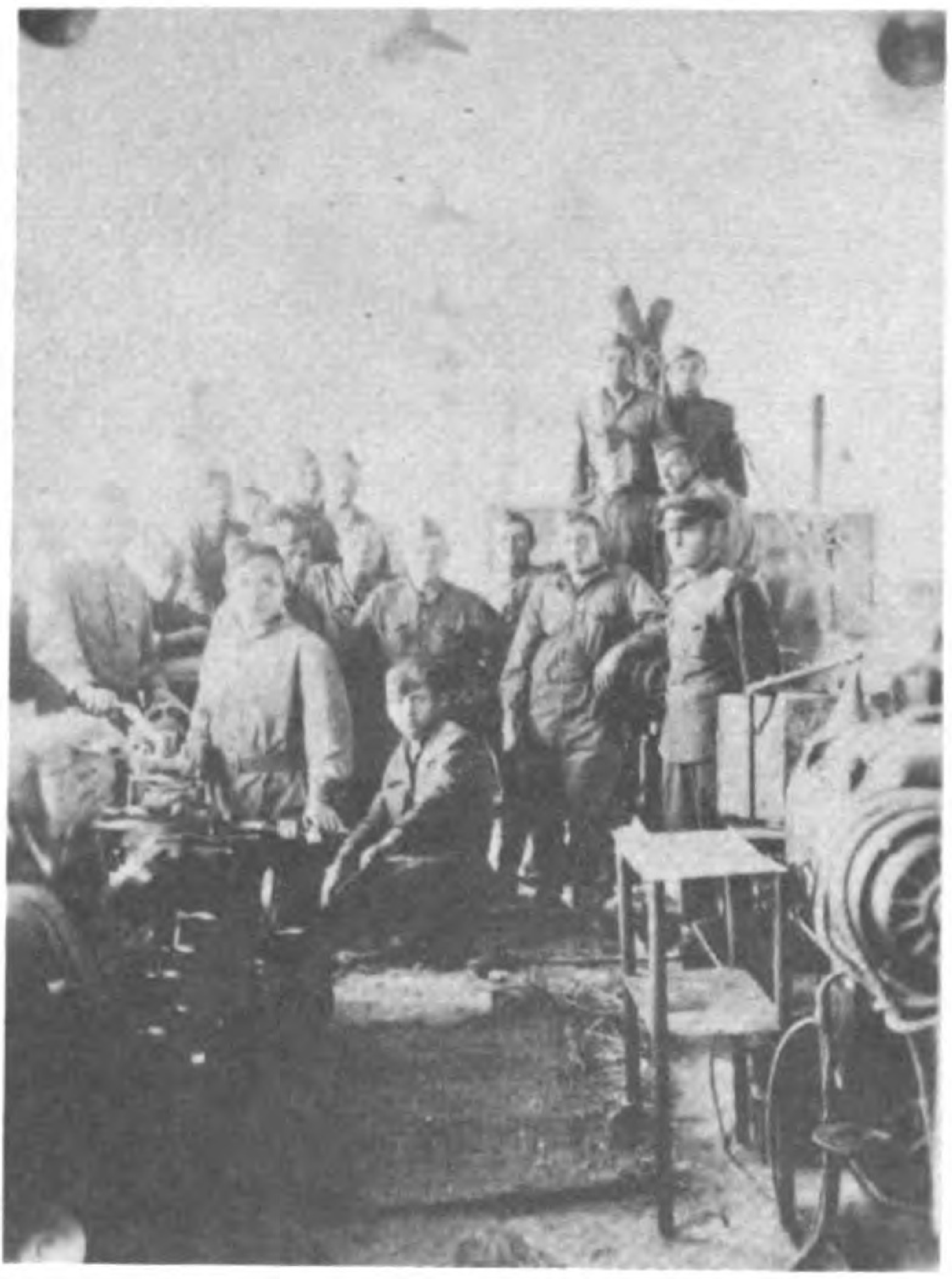
In the case of removal of equipment from the repair and maintenance departments of industries processing basic materials such as iron and steel, coal, cement, etc., the operations gradually come to a stop due to the lack of adequate repair and maintenance equipment necessary to keep the plant in operation. And so the removal of machine tools, affected seriously the entire economy of Manchuria and other parts of Asia depending upon the industries of Manchuria.

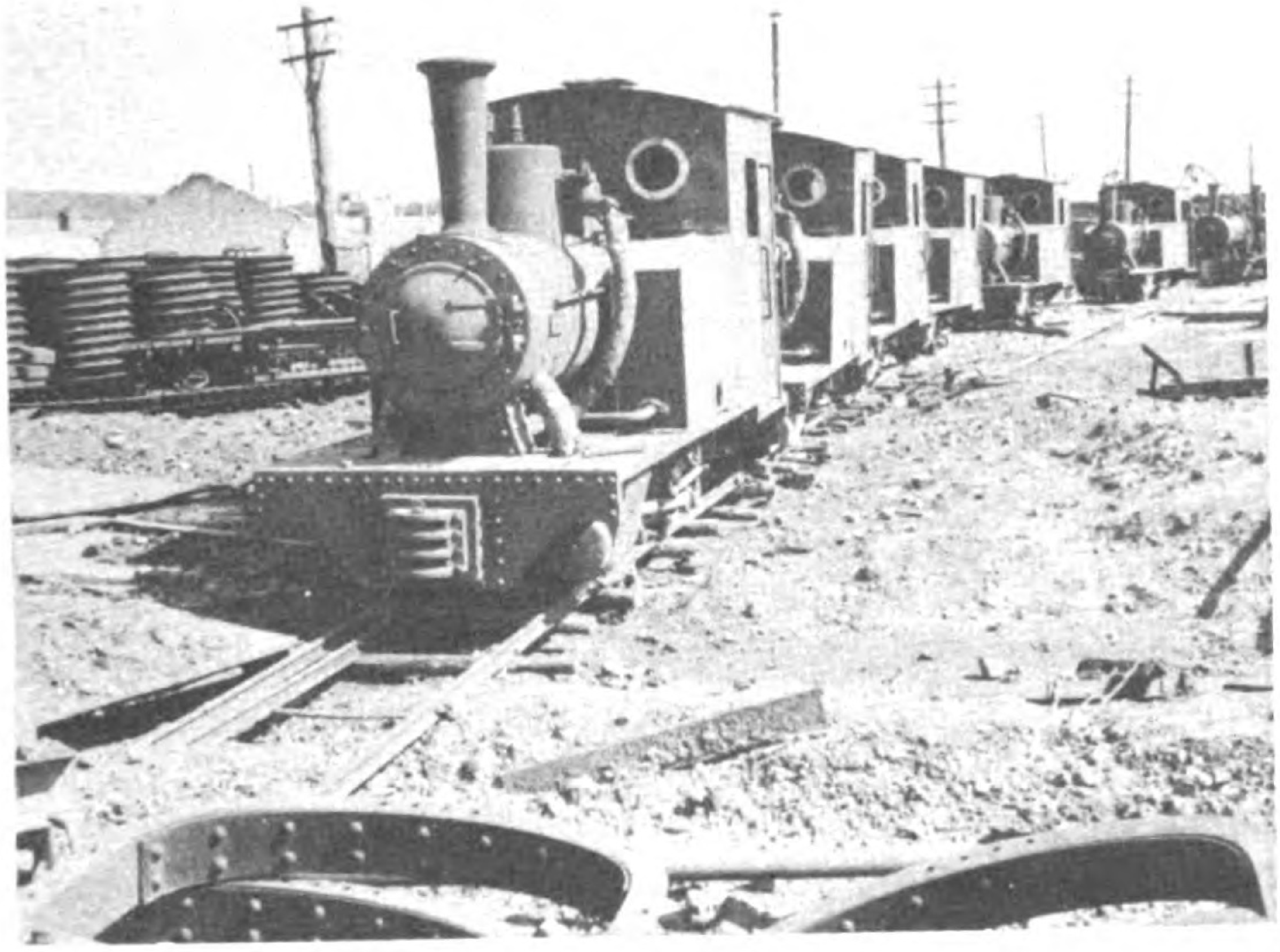
It was observed that where machine tools were removed, the practice was general to remove the small tools, such as milling cutters, twist drills, taps, reamers, grinding wheels and other perishable items along with supplies of tool steel, mill supplies and other critical material and the value of such items is believed to equal the dollar value of the machinery taken, that is $58,000,000.



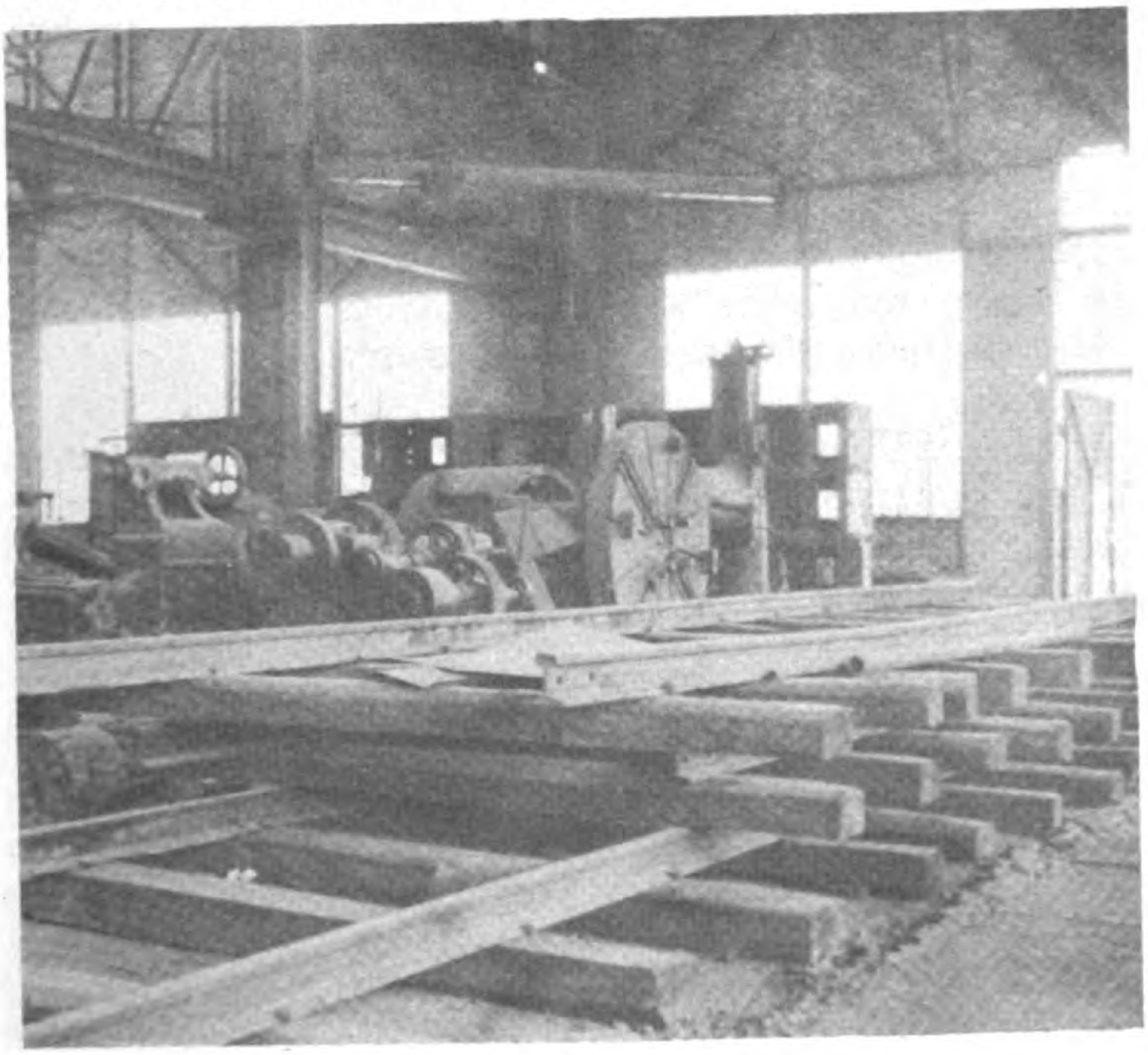
Manchuria

Soviet soldiers in process of removing industrial equipment from Manchuria factories. Pictures copied from a set furnished by Chinese authorities in Manchuria.





ANSHAN NUMATA MACHINERY CO., ANSHAN - This plant built narrow gauge steam locomotives and dump cars which were used mostly for mining and construction work. Shops were partially stripped by Chinese Communists and mobs. Soviets removed 300 tons of unfabricated steel but left eight new locomotives untouched.



**MAIN REPAIR SHOP** at the Anshan plant of the Manchuria Iron and Steel Company. Spur was laid in one building for direct loading of heavy machine tools.

Further damage to the metal working industry was done by the removal of the following items:

| | |
|---|---|
| Electric Melting Furnaces and Cupolas | $10,000,000 |
| Gas and Electric Welding Equipment | 5,000,000 |
| Cranes and Material Handling Equipment | 10,000,000 |
| Laboratory Equipment | 2,000,000 |
| Electrical Equipment (Motors, generators and controls) | 10,000,000 |
| Auxiliary Equipment | 10,000,000 |

It was noted that in these catagories removals were very extensive. The value figures are based on the proportion and cost of such equipment customarily in use with the volume of machine tools installed and the purpose for which they were intended. In many cases where an entire plant was removed, the drawings of the product together with the jigs, fixtures and special tools necessary for the manufacture of the product were also taken. No estimate was made for such losses.

Losses connected with the damages to buildings and office equipment were not estimated, but considering the figures given above and allowing something for the latter items the overall physical loss to the metal working industry occasioned by removals and damages to the property during Soviet occupancy would reach $163,000,000.

Plant inspection reports covering the metal working industries will be found in Appendix 7.

Except in the case of the aircraft and automotive industries, the machine tools in use in Manchuria were predominantly of Japanese manufacture. In the case of the aircraft and automotive plants, about 25 per cent of the machine tools came from the United States.

A chart giving a check of plants in Manchuria using machine tools and metal working equipment will be found in Appendix 7a. The data upon which this chart was made was secured by the Northeast Economic Commission of the Chinese National Government.

The machine tool and metal working industries are intimately interwoven with all the basic industries. If the basic industries are to be restored, the rehabilitation of the machine tool and metal working industries must have early priority.

# CHAPTER VIII

# NON-FERROUS MINING AND METAL INDUSTRIES

## A. OUTLINE OF INDUSTRY

Coal, Manchuria's most important mining product, is covered in Chapter IV of this report. Iron ore, another important resource, is covered in Chapter V. Visits by the Pauley Mission to other mines and sources of mineral production were limited due primarily to the fact that many of the mining centers were not under the control of the Chinese Nationalist Government, and also because time did not permit travel to remote mining areas. Transportation facilities were entirely inadequate for rapid trips into remote regions.

The most important mine visited, coal and iron ore excepted, was a molybdenite mine at Yangchichangtsu in northwest Liaoning Province. According to Plant Inspection Report 6-B-1, in Appendix 8, "This deposit is certainly one of the largest known molybdenite deposits in the world". This mine started operation as a small lead-zinc producer in 1935. Molybdenum was discovered in 1939, and as further exploration was made during the war, the mine was converted to a major producer of molybdenite, about which the outside world has very little information. At present this mine is operating at about 10 percent capacity due to the lack of power, supplies and repair materials.

In spite of rumours during the war that there were several smelters in Manchuria producing refined copper, apparently there was only one in actual production, although a modern smelter was under construction in Antung at the close of the war. The smelter at Mukden, covered by Plant Inspection Report 1-B-1, in Appendix 8, produced the refined metals as listed below:

| Year | Gold kgs. | Silver kgs. | Copper M/tons | Lead M/tons |
|---|---|---|---|---|
| 1939 | 254 | 2,853 | 605 | 1,407 |
| 1940 | 326 | 4,897 | 1,328 | 2,718 |
| 1941 | 346 | 9,897 | 1,261 | 5,419 |
| 1942 | 845 | 16,176 | 1,999 | 4,985 |
| 1943 | 330 | 3,261 | 1,533 | 4,606 |
| 1944 | 334 | 6,972 | 1,999 | 3,538 |

The above figures for copper probably represent Manchuria's full production of refined copper for the period. The Mission learned from Japanese sources that some copper ore was being shipped into Korea for smelting, but the bulk was handled at the Mukden smelter.

While Manchuria has several large low-grade copper deposits, their economic value is doubtful. It is reasonable to believe that the Japanese developed the Manchurian copper resources well beyond a normal economic limit during the war.

Considerable copper bearing scrap was also treated at the Mukden smelter. Numerous Chinese coins scattered about the premises verified the report that all metal coins were taken from circulation and melted down during the war. At the present time there is a pile of old bronze in the smelter yard which is the remnants of columns and facing of some Chinese structure, possibly a temple. These facts probably account for the discrepancy between the amount of refined copper produced and the amount of copper ore mined, the latter figure being shown in a following tabulation.

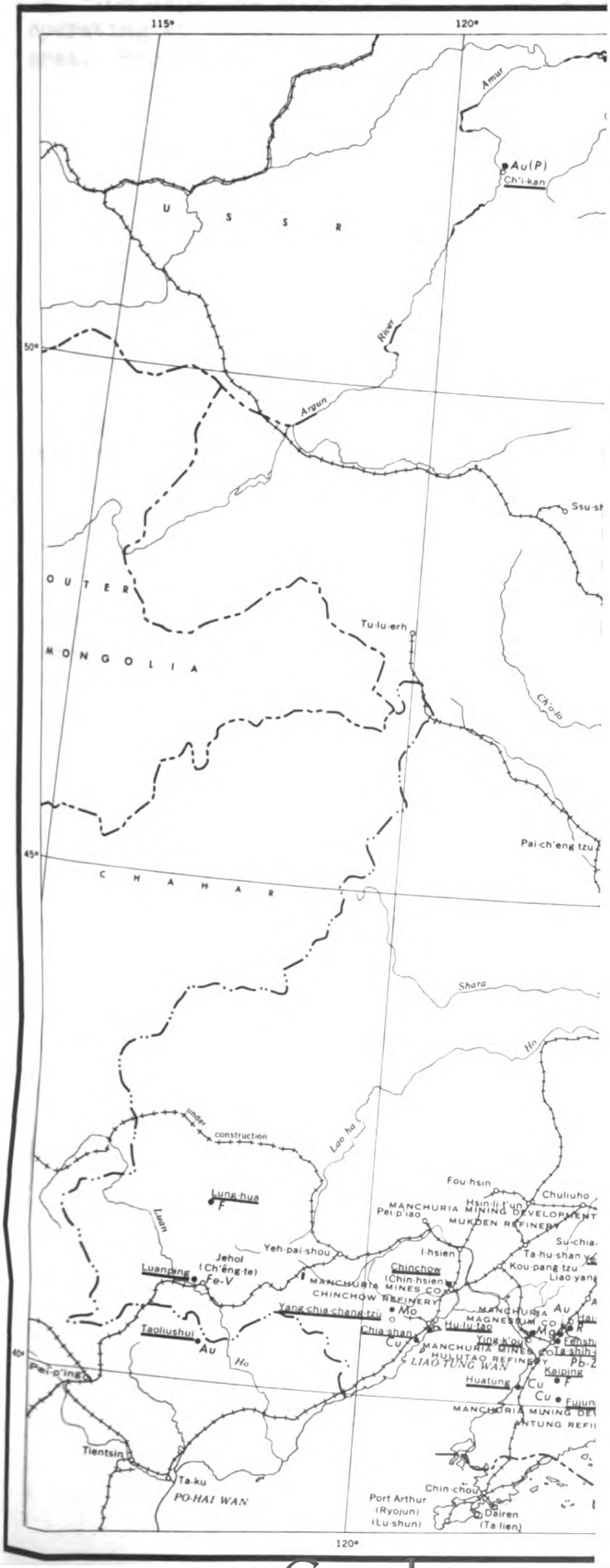
Plant Inspection Report 1-G-3, in Appendix 8, outlines conditions at the Manchurian Light Metal Company at Fushun. This plant produced about 8,000 tons of aluminum per year from the aluminous shale in the Penchihu district. It is believed that the production costs at this plant are entirely out of line for anything except a war-time economy.

A smelter producing ferro-vanadium and titanium oxide was visited at Chinchow. The ferro-vanadium was used primarily in the Manchurian steel industry while the titanium oxide was shipped to Japan for use in the production of titanium white and in the electrical industry. For further information, refer to Plant Inspection Report 23-A-1, in Appendix 8.

The following production figures for the Chinchow smelter were supplied by a former Japanese director and mining engineer of the Manchuria Mines Company. These figures vary substantially from those supplied for Plant Inspection Report 23-A-1 by the Japanese manager of the smelter. The Mission found that such discrepancies were not unusual when comparing figures from separate sources in Manchuria.

| Year | Ferro-vanadium kgs. | Vanadium % | Vanadium kgs. |
|---|---|---|---|
| 1943 | 40,000 | 35. | 14,000 |
| 1944 | 67,486 | 38.69 | 26,112 |
| 1945 | 23,703 | 35.50 | 8,415 |
| TOTALS | 131,189 | 36.99 | 48,527 |

Information had been received that there was a lead smelter at Hulutao. However, investigation determined that although this plant had been designed originally to smelt lead and zinc, it had been converted to the production of sulphuric acid from pyrite. See Plant Inspection Report 6-C-1, in Appendix 10.


115°
120°
Amur
Au(P)
Ch'i-kan
U S S R
50°
River
Argun
Ssu-sh
O U T E R
M O N G O L I A
Tu-lu-erh
Ch'o-lo
Pai-ch'eng tzu
45°
C H A H A R
Shara
Ho
under
construction
Lao ha
Lung-hua
F
Luan
Fou-hsin
Chuliuho
Hsin-li-t'un
MANCHURIA MINING DEVELOPMENT
Pei-p'iao
MUKDEN REFINERY
Su-chia
Ta-hu-shan
Yeh-pai-shou
I-hsien
Kou-pang-tzu
Liao-yang
Jehol
(Ch'êng-te)
Luanping
Fe-V
Chinchow
(Chin-hsien)
MANCHURIA MINES CO
CHINCHOW REFINERY
Au
Yang-chia-chang-tzŭ
Mo
MANCHURIA
MAGNESIUM CO
Hu-lu-tao
Mg
R
Taoliushui
Au
Chia-shan
Cu
Ying-k'ou
Fensh
MANCHURIA MINES CO
HULUTAO REFINERY
Ta-shih
Ho
LIAO-TUNG WAN
Pb-Z
40°
Pei-p'ing
Kaiping
F
Huatung
Cu
Cu
Fujun
MANCHURIA MINING DEV
ANTUNG REFI
Tientsin
Ta-ku
PO-HAI WAN
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
120°

717231 O - 1946 - 179A

From Japanese sources we received a report of a lead smelter operating at Hsuiyen, in connection with the lead mines in the Antung area. Production figures for this smelter were given as follows:

HSUIYEN LEAD SMELTING PLANT PRODUCTION

| Year | Silver (gs.) | Lead (kgs.) |
|---|---|---|
| 1942 | 810,919 | 392,676 |
| 1943 | 6,485,161 | 2,990,205 |
| 1944 | 4,053,420 | 1,752,838 |
| 1945 | 1,234,684 | 576,828 |
| TOTAL | 12,584,184 | 5,712,547 |

Magnesium was produced from seawater at Yingkou, it was reported, but production was nominal as is shown below:

| | |
|---|---|
| 1942 | 55 tons |
| 1943 | 241 " |
| 1944 | 402 " |

Reports also state that a plant having a capacity of 1800 tons of magnesium annually was under construction in Yinkou at the close of the war.

The following tabulation showing the 1944 production figures for non-ferrous mineral products in Manchuria was taken from information in the Japanese Source File 302-Y.1-1, "Economical Review of the North East Provinces of China":

| | Metric Tons Per Annum |
|---|---|
| Aluminum | 7,618 |
| Copper ore (6-20%) | 2,239 |
| Lead ore (50-98%) | 6,145 |
| Zinc ore (47-55%) | 1,000 |
| Molybdenum ore (68%) | 864 |
| Magnesium | 402 |
| *Vanadium (refined) | 120 |
| Chrome ore (40%) | 79 |
| Antimony | 54 |
| Silver | 10.8 |
| Tungsten ore (65%) | 4 |
| Gold | .6 |
| Mercury | .2 |
| Coal | 25,626,704 |
| Magnesite | 603,551 |
| Fire Clay | 447,237 |
| Aluminous shale | 147,196 |
| Fluorite | 96,900 |
| Magnesia, hard calcined | 82,957 |
| Magnesia light calcined | 24,533 |
| Graphite | 25,732 |
| Talc | 17,415 |
| Salt | 13,600 |
| Pyrite | 6,413 |
| Asbestos | 4,230 |
| Mica | 854 |

*This figure does not check with other sources.

Uranium, in addition to the above-listed mineral products, was mined during the war in Manchuria. It was reported to Norman Taylor of the Pauley Mission by Japanese engineers that in 1944 the Manchukuo Government took an active interest in developing their sources of uranium. Late in 1944 boxes containing 50 kilograms each of ore concentrate were delivered to representatives of the Kwantung Army. The material then was shipped to Tokyo by plane but its ultimate destination and use were unknown to these engineers. While development was stopped in April 1945, operations were resumed in July 1945 but of course came to an end at the time of the Japanese surrender. We were further given to understand that the Soviets took a lively interest in the uranium project. The Soviets questioned those people connected with the project and upon their withdrawal from Manchuria, took with them several of the Japanese technicians together with laboratory equipment and records.

Prior to the industrial development in Manchuria, gold was the most important mining product. For centuries gold has been mined in Manchuria's placer deposits. When the Japanese took over Manchuria in 1931 they proceeded to develop the gold resources extensively. Shortly after the start of World War II emphasis on gold mining decreased, and was stopped altogether by a Manchukuo Government ordinance in October 1942. Japanese sources report that there were about 27 gold dredges in operation at that time. Both Japanese and Chinese sources were rather vague about the production and disposition of gold bullion.

According to Japanese sources all gold produced was sent to the Manchuria Central Bank in Changchun. In Plant Inspection Report No. 1-B--1 the Soviets were reported to have removed 250 kilograms of gold from the Mukden smelter. Chapter XVI on "Precious Metals, Currency and Securities" covers the probable disposition of gold in the Manchuria Central Bank.

Two tabulations follow, one showing gold production in Manchuria since 1941 and the other silver, lead and zinc production for the same period. This information was obtained from a former Japanese Director and Chief Mining Engineer of the Manchuria Mine Company. Further information supplied by this source will be found in Source File No. 303-B-1.

# GOLD PRODUCTION IN MANCHURIA SINCE 1941
(Grams)

| Name of Mine | 1941 | 1942 | 1943 | 1944 |
|---|---|---|---|---|
| (1. Lode Mines) | | | | |
| Chiapikow | 166,389 | 398,165 | 517,449 | 647,623 |
| Laochinchiang | - | 162,154 | 312,133 | 286,047 |
| Fenshui | 270,872 | 134,399 | 9,525 | - |
| Wulung | - | 4,207 | 30,355 | 17,454 |
| Huatung | - | 2,555 | 73,137 | 77,346 |
| Taoliushui | 179,561 | 109,561 | 109,541 | 2,928 |
| Kaishantun | 14,588 | 7,990 | - | - |
| Chinchangtung | 12,534 | - | - | - |
| Paomachuan | 4,727 | 1,608 | - | - |
| Chengpei | 32,224 | 20,394 | - | - |
| Chingchangkouliang | 399 | - | - | - |
| Niuhsinshang | - | 11,625 | - | - |
| Chingyuan | 112,800 | 94,000 | 80,370 | 84,600 |
| Yuerhai | 13,160 | - | - | - |
| Shichutzu | - | - | 55,000 | 43,000 |
| Paoling | 6,875 | 45,900 | 30,600 | - |
| Chiashan | - | 15,300 | 95,472 | 45,518 |
| Wuchiatzu | 4,320 | - | - | - |
| Shitzuling | 21,140 | - | - | - |
| Yenho | 36,805 | - | - | - |
| Chinchang | 34,000 | - | - | - |
| TOTAL | 910,394 | 1,007,858 | 1,313,582 | 1,204,516 |

## GOLD PRODUCTION IN MANCHURIA SINCE 1941 (continued)
(Grams)

| Name of Mine | 1941 | 1942 | 1943 | 1944 |
|---|---|---|---|---|
| (2. Placer Mines) | | | | |
| Heiho | 688,240 | 157,488 | - | - |
| Chiamussu | 631,008 | 279,285 | - | - |
| Hunchun | 195,060 | 80,972 | - | - |
| Yenchi | 320 | - | - | - |
| Hsiaoshihton | 262,235 | 447,014 | 245,262 | - |
| Chunhua | 15,872 | 39,865 | - | - |
| Muleng | 79,913 | 143,272 | 297,697 | - |
| Chuangho | 1,070 | - | - | - |
| Miscellaneous | 55,628 | 16,622 | - | - |
| TOTAL | 1,929,346 | 1,164,518 | 542,959 | - |
| GRAND TOTAL (Lode and Placer Mines) | 2,839,740 | 2,172,376 | 1,856,541 | 1,204,516 |

# SILVER, LEAD, & ZINC PRODUCTION IN MANCHURIA SINCE 1941

| Name of Mines | Name of Company | 1941 | 1942 | 1943 | 1944 |
|---|---|---|---|---|---|
| | | (1. Silver - Grams) | | | |
| Chiapikou | Manchu Mining Co. | 146,974 | 295,448 | 439,885 | 584,904 |
| Laochinchiang | " " " | 26,450 | 85,605 | 139,207 | 251,262 |
| Chingchengtzu | " " " | 13,439,749 | 13,936,145 | 14,712,950 | 10,413,722 |
| Hsuiyen | " " " | - | 810,919 | 6,485,161 | 4,053,420 |
| Kwanjen | " " " | - | 281,326 | 2,302,892 | 3,271,871 |
| Huatung | " " " | - | 31,819 | 664,570 | 784,733 |
| Taoliussui | " " " | 443,662 | 246,062 | 7,202 | - |
| Miscellaneous | " " " | 5,870,561 | 6,190,610 | 2,561,320 | 3,015,162 |
| TOTAL | | 19,927,396 | 21,877,934 | 27,304,187 | 22,375,074 |
| | | (2. Lead - Kilograms) | | | |
| Chingchengtzu | " " " | 5,707,774 | 6,126,258 | 6,550,042 | 4,409,644 |
| Hssuiyen | " " " | - | 392,676 | 2,990,205 | 1,752,838 |
| Kwanjen | " " " | - | 130,996 | 1,089,016 | 1,282,221 |
| Yangchiachiangtzu | " " " | 2,713,774 | 2,112,211 | - | - |
| Tenpaoshan | Tenpaoshan Mining Co. | 425,564 | 528,876 | 528,876 | 304,676 |
| TOTAL | | 8,847,112 | 9,291,017 | 11,158,139 | 7,749,379 |
| | | (3. Zinc - Kilograms) | | | |
| Chingchengtzu | Manchu Mining Co. | - | 182,734 | 225,547 | 139,968 |
| Hsuiyen | " " " | - | 666,938 | 3,718,766 | 1,478,412 |
| Kwanjen | " " " | - | 226,395 | 2,295,849 | 2,054,874 |
| Yangchiachiangtzu | " " " | 3,319,991 | 3,039,236 | - | - |
| Tenpaoshan | Tenpaoshan Mining Co. | 346,500 | 419,265 | 419,265 | 249,480 |
| TOTAL | | 3,666,491 | 4,534,568 | 6,659,427 | 3,922,734 |

A sharp drop in production of lead, zinc, and silver for the year 1944 is noted in the above figures. This probably was the result of shipping losses and the strangling economic blockade by the American Navy. On the other hand, as far as mining is concerned, it might well have been caused by failure of the Japanese to maintain the proper balance between development work and ore production in the early years of the war.

## B. CORPORATE CONTROL OF MANCHURIAN NON-FERROUS MINING

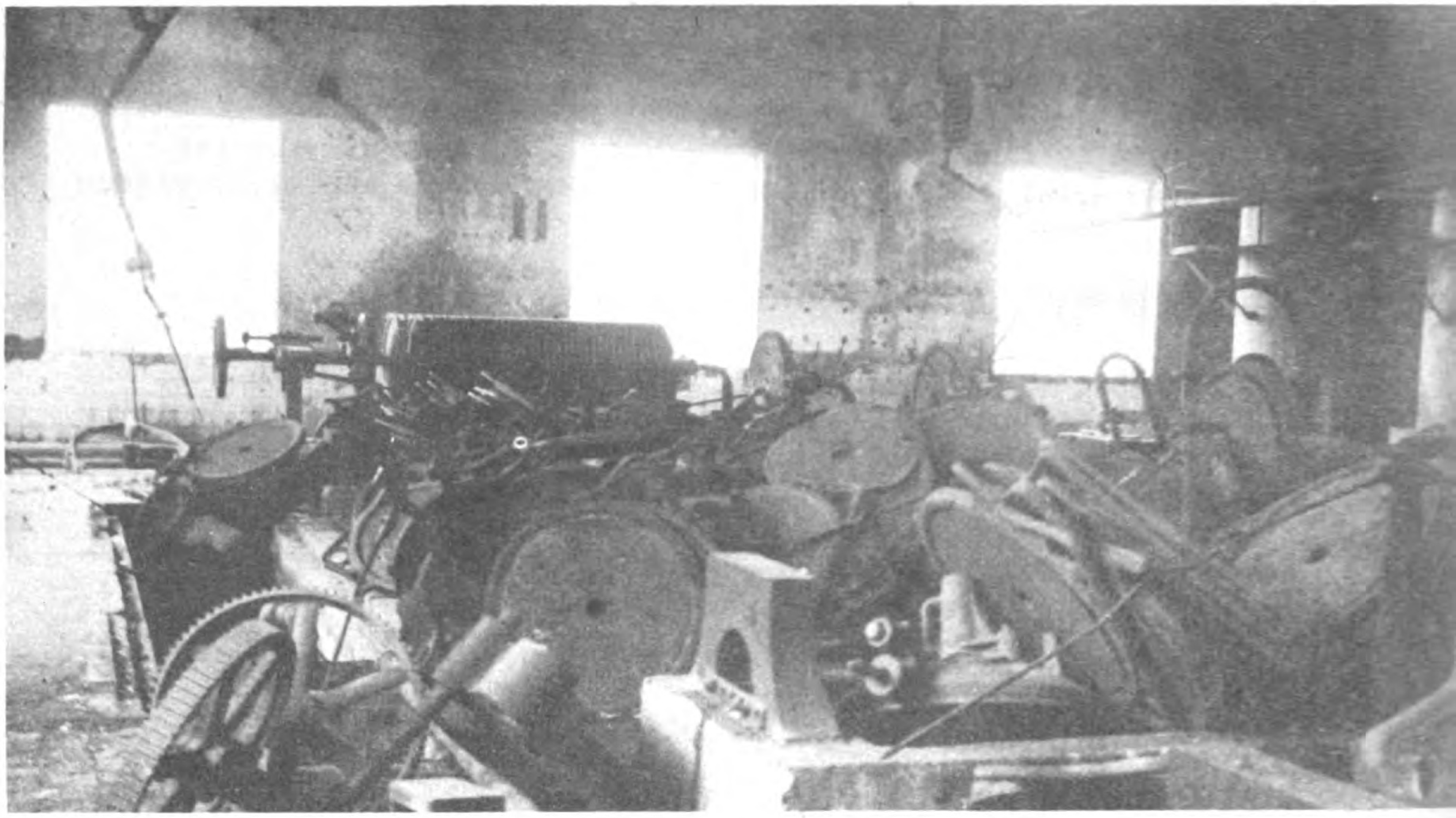
As in the case of the coal mines, which have been discussed in Chapter IV of this report, the major control of non-ferrous mines is by the Manchurian Industrial Development Corporation, known as MANGYO, which was organized in 1937. The latest available information on the capitalization and control of Manchurian non-ferrous mines is shown in Japanese Source File 302-Y.-1-1, "Economical Review of the North-eastern District of China" pages 56 to 83.

## C. EFFECT OF SOVIET OCCUPATION

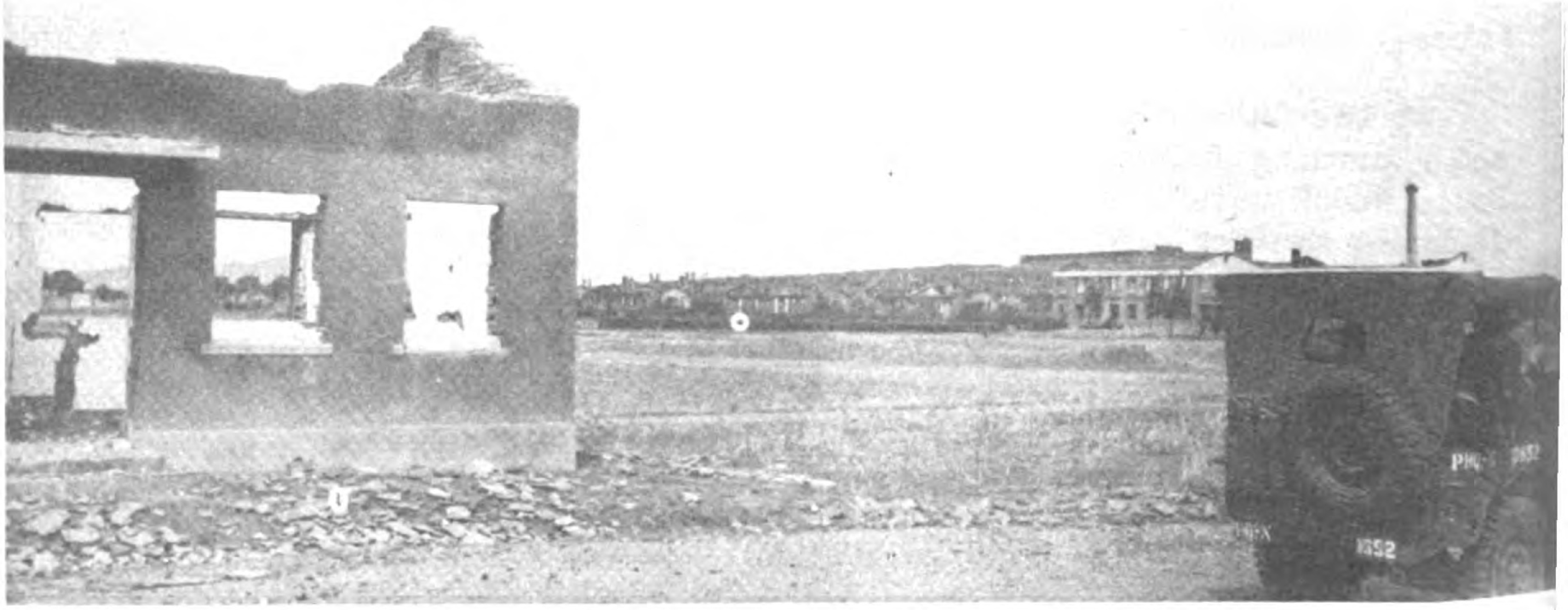
The effect of Soviet occupation on the mines and smelter installations visited by the Pauley Mission was found to be much less destructive than in most other industries. At the Yangchiachangtzu molybdenum mines, the Soviet troops apparently removed only minor equipment, mostly motor cars, except for the hospital, which was thoroughly stripped. They also removed all the mines' stores of supplies of foodstuffs. This mine was occupied by the Soviets for a period of two weeks in September, 1945. Mine installations have suffered considerable destructive looting by the local population. The Chinese Communist Army occupied the area following the Soviet departure in the fall of 1945. They removed nearly all the belting and mine car bearings as well as a number of electrical motors. However, all major mine installations are intact and are in operating condition. The mine is producing at about 10 percent capacity at present but could immediately go into normal production if power, supplies and repair materials were available. Power was obtained formerly from Chinchow.

At the Chinchow smelter, all machine tools, electric motors, belts, and recording instruments were reported to have been removed by the Soviets. However, the main smelter installations remain intact. The Japanese manager also reported that the office buildings and the village in which the workmen lived were destroyed by the Soviets on September 19,1945. At the same time, considerable vandalism occurred to light equipment in the smelter, although the major installations were not harmed.

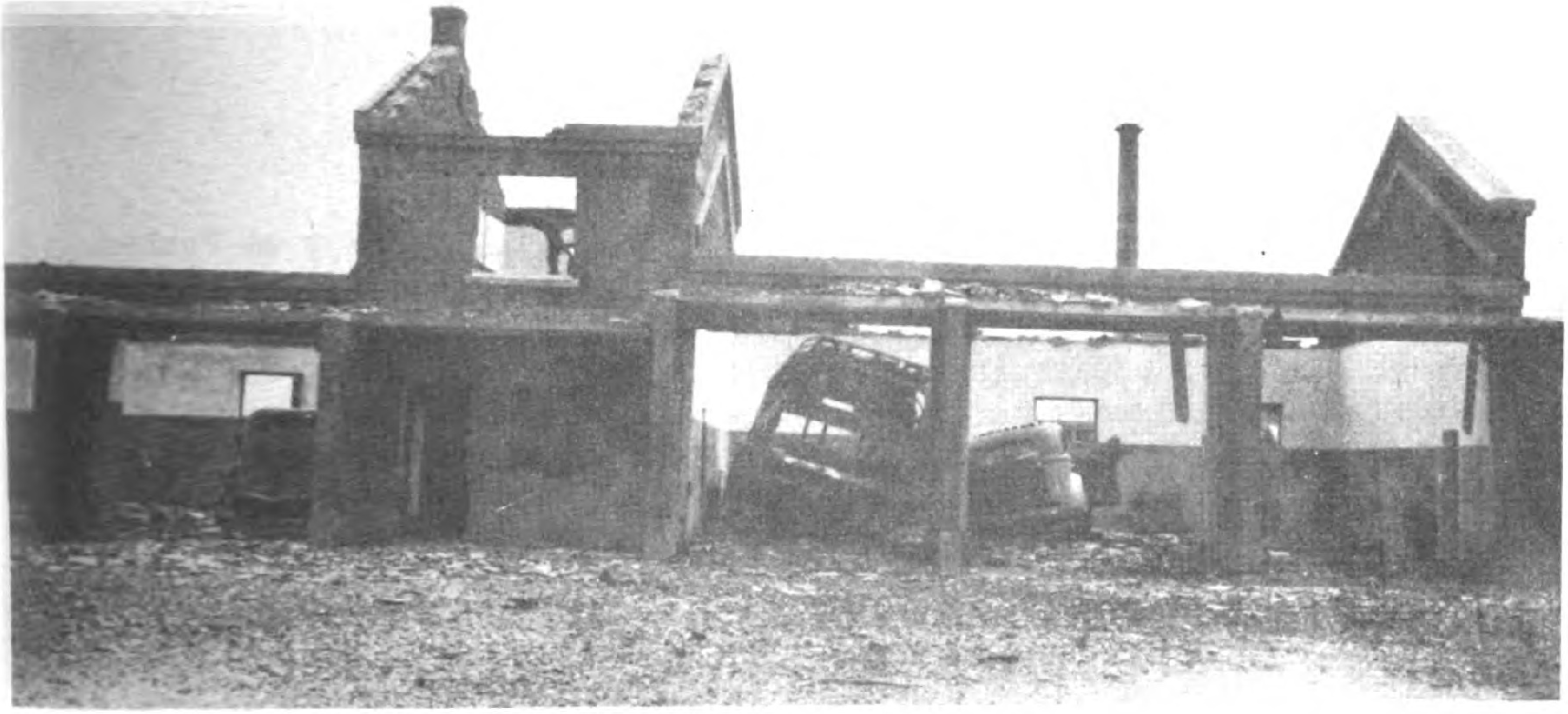
At the Mukden refinery all major installations were left intact by the Soviets although they did remove considerable supplies, automotive and laboratory equipment as well as all the refined products on hand, even to cleaning some of the gold-bearing sludge from the lead refinery.



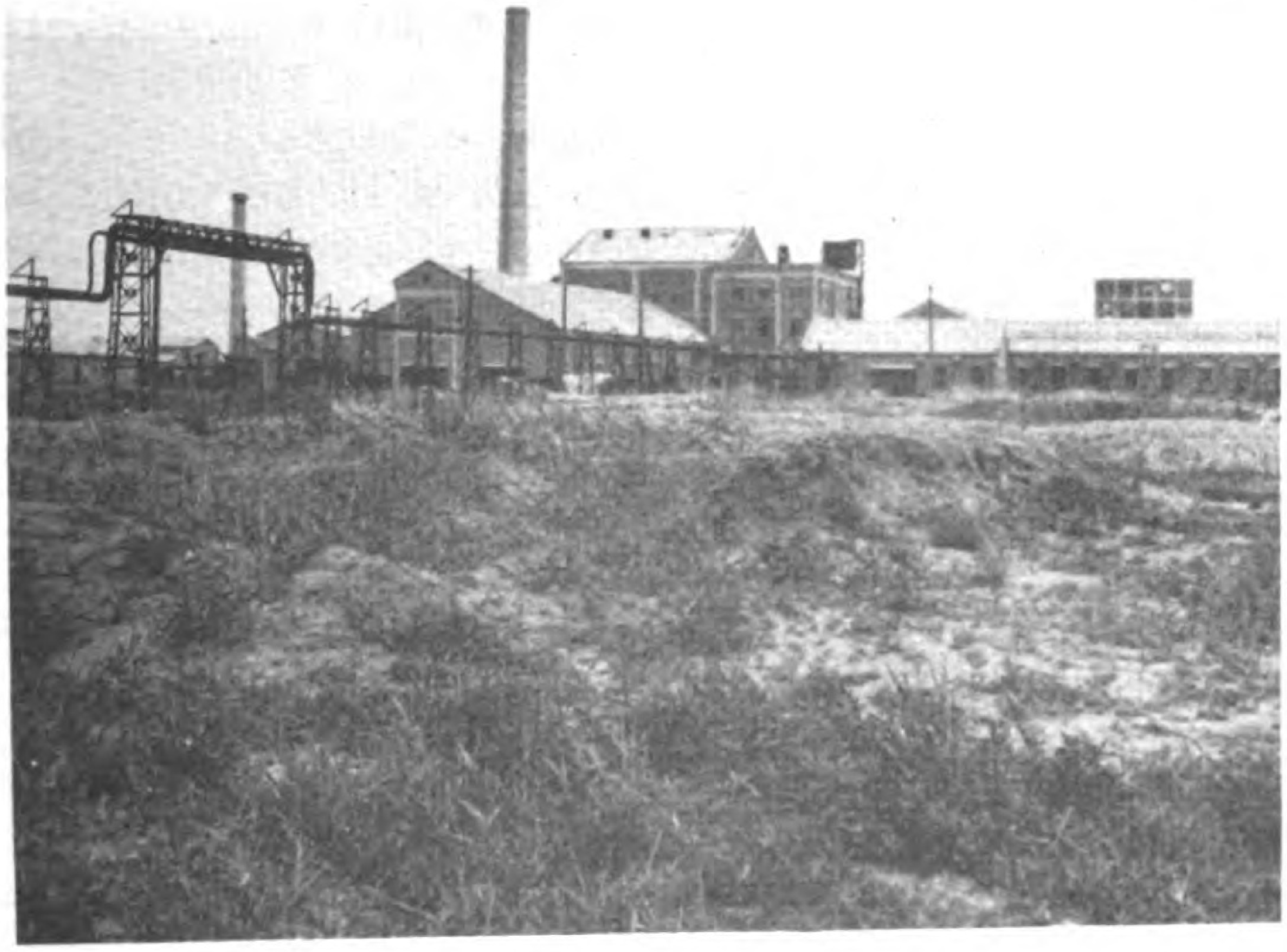
Ferro-Vanadium Smelter - Chinchow
Major installations at this plant were left intact but vandalism was practiced on smaller equipment such as the filter presses above. The Japanese manager of this plant reports that this occurred on September 19, 1945.



The remains of plant workers' dwellings which were reported to have been pillaged by Soviet troops.



Garage at ferro-vanadium smelter near Chinchow



Smelter at Mukden showing 400 foot smoke stack. Plant installation left intact but Soviets reportedly removed stocks of refined gold, silver, copper, and lead.

A detailed list of removals and damages will be found in Plant Inspection Report 1-B-1. Below is a list of finished smelter products reported removed:

| | | | | |
|---|---|---|---|---|
| Refined | copper | ingots | 250 | tons |
| " | lead | " | 500 | " |
| " | zinc | " | 10 | " |
| " | silver | " | 15 | " |
| " | gold | | 250 | kilograms |

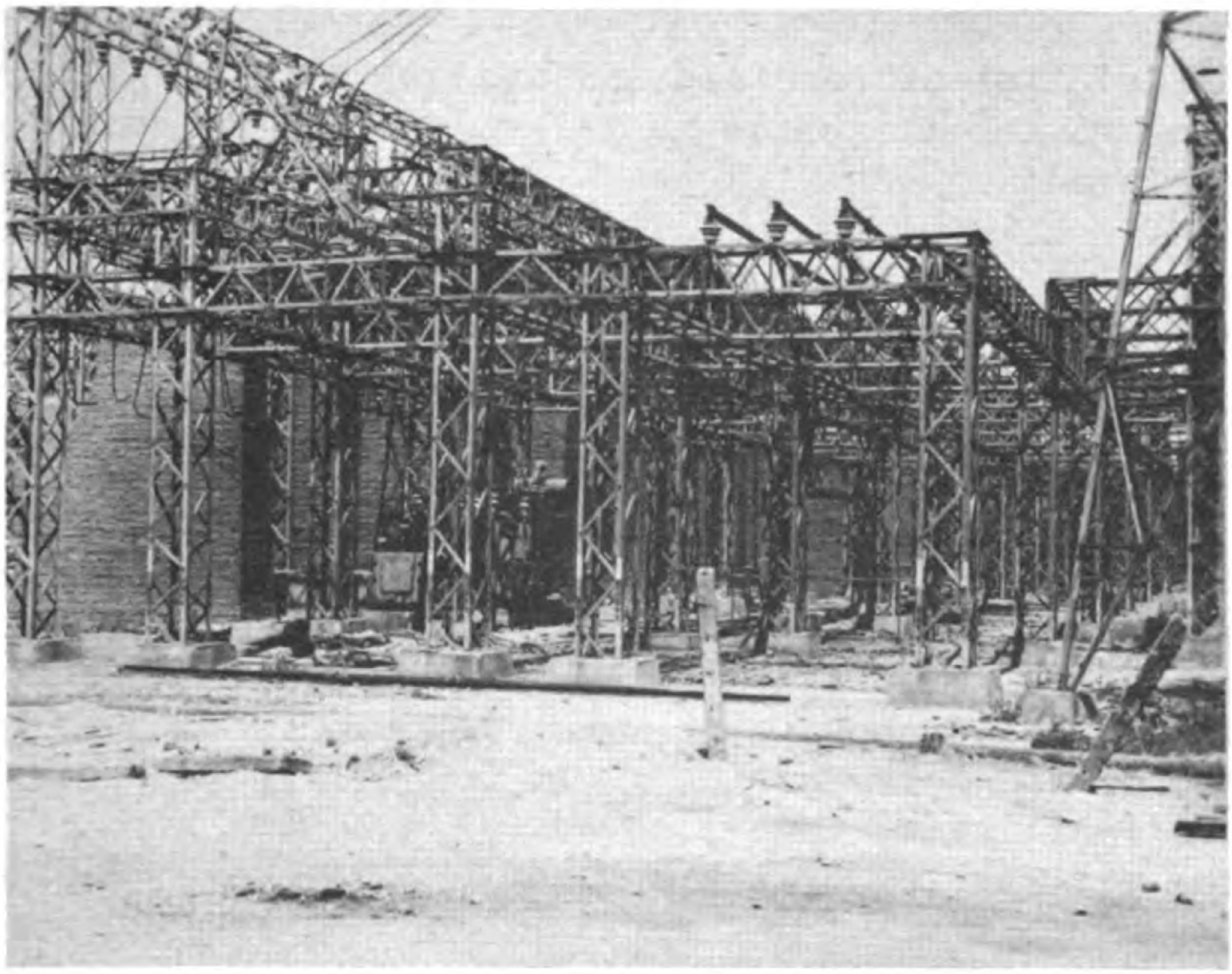
Soviet removals from the Manchurian Light Metal Company at Fushun were extensive. The rotary kilns, electrolysis units, some of the arc furnaces, and most of the essential electric facilities such as rectifiers and sub-station equipment, were reportedly removed by the Soviets during October and November 1945. As usual, all supplies, including all medical facilities, were removed. A detailed list of removals and destruction will be found in Plant Inspection Report 1-6-3 in Appendix 8. At present this plant is useless from an operating standpoint.

## D. ESTIMATED VALUE OF REMOVALS

The estimated value of equipment in the mining and smelting industry removed and/or damaged in place either by the Soviets or as a result of the Soviet occupation, is considered to be approximately $9,000,000. In addition supplies and finished products estimated to have an approximate value of $1,000,000, were also removed, making a total loss to the industry of $10,000,000.

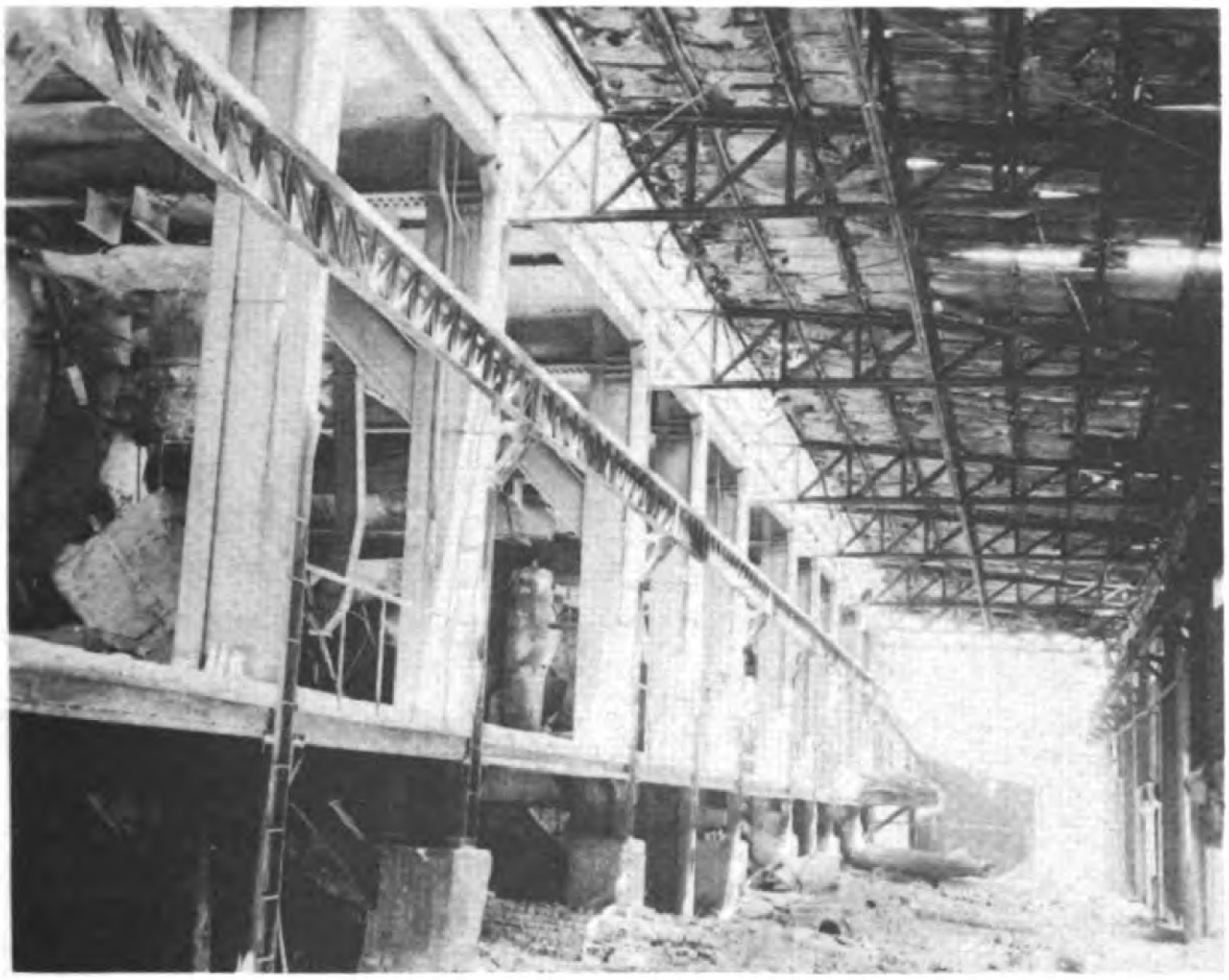
It was reported that the Soviets stationed a staff of engineers and geologists at the Haicheng uranium mine, from November 1945 to January 1946, during which time a thorough survey and reconnaisance was made. They informed the local Japanese technicians that the Soviets planned to bring in modern machinery to work the mine.

A detailed list of damages to the Manshu Magnesium Company, Ltd., in Yingkou as a result of Soviet occupation will be found in Source File 202-AG-1. This information was supplied by Japanese and Chinese sources. The Pauley Mission did not visit this plant.



MANCHURIA LIGHT METALS COMPANY, FUSHUN

Frame work of outside transformer station at this aluminum plant from which all but two or three transformers were removed.



MANCHURIA LIGHT METALS COMPANY, FUSHUN

Battery of three phase electric furnaces partially demolished by removal of parts, particularly Sodeberg Electrodes, during Soviet occupancy.

## CHAPTER IX

## LIQUID FUEL AND LUBRICANT INDUSTRY

### A. INTRODUCTION

Prior to 1931 petroleum distribution in Manchuria was largely in the hands of the international oil companies. After 1931 Japanese interests began to participate in Manchurian trade, and in 1935, the puppet state of Manchukuo established an oil monopoly which barred the foreign companies from marketing and distributing petroleum with the exception of lubricants. However, they were allowed to sell both crude oil and products to the monopoly. The foreign companies refused to operate under such an arrangement and withdrew from the market except for selling a small quantity of lubricants.

Although an extensive search for natural petroleum has been made in Manchuria, particularly since the Japanese occupation in 1931, no production of consequence has been forthcoming. Considerable drilling in the vicinity of Fouhsin was reported as unsuccessful and reports, just prior to the war, of the discovery of crude oil deposits near Lake Hulunchih were not substantiated by information supplied by several Japanese technologists who were questioned by the Pauley Mission. Also, no plants were found in which Manchurian-produced oil was being refined.

Because of its serious lack of self-sufficiency in petroleum, Japan had previously begun to plan and build plants for the manufacture of petroleum substitutes from coal and other raw materials available in Manchuria. The oil-shale industry was given the first impetus for expansion, then research in synthetic fuels was started and companies were founded to construct synthetic fuel plants based largely on German designs. Their attempt at self-sufficiency in petroleum must be considered a failure, due principally to failure of the processes to operate satisfactorily, and inability to complete construction of the plants during the war.

The Japanese had, since their acquisition of the South Manchurian Railway properties from Russia in 1905, developed an oil-shale industry at Fushun to produce petroleum substitute products from the oil-shale deposits overlaying the coal beds in the Fushun open-pit mine. Even before the war this was the largest oil-shale installation in the world and during the war, additional facilities were added to more than triple the previous capacity. Actually, the oil-shale plants near Fushun accounted for over 85 per cent of the total liquid fuels produced in Manchuria during the war. Three small refining units operating on imported crude oils produced an additional 10 per cent of the liquid fuels, while the seven synthetic fuel plants using coal as the raw material, yielded on an average less than 5 per cent of the fuel supply. These plants were planned to greatly increase Japan's self sufficiency in liquid fuels and are estimated to have cost nearly 50 million dollars to construct. However, they were generally unsuccessful in operation, and can be considered to be only in the experimental stage. The Japanese during the war built small units in various industrial plants to make synthetic lubricating oils from such raw materials as soya bean oils, shale-oil paraffin and light oils. These plants had a capacity to produce 63,000 barrels yearly, but the maximum yearly production was 13,338 barrels in 1943.

The operating oil-shale plants are located near Fushun at the shale sources and the petroleum refineries are near the seaports of Dairen and Hulutao, with the exception of the small topping units in the Army Fuel Depot at Ssupingchieh. The synthetic fuel plants are generally located near coal supplies and transportation centers in the South Manchurian Railway Zone of southeastern Manchuria. The accompanying map shows the location of the various plants, oil-shale deposits, reported petroleum deposits, petroleum products distribution depots and marine terminals.

Eight of the 13 liquid fuel and lubricant plants in Manchuria were inspected. Of the five remaining plants, four were in Chinese-Communist-controlled territory to which admission could not be obtained. The fifth, a low-temperature-tar plant, supposedly located in Harbin, was unknown to the local Communist officials. The eight inspected plants are representative of the different types of installations. The two most important plants that were not inspected were the East Oil-Shale Factory near Fushun and the Manchu Petroleum Refinery at Dairen. A more detailed description of each plant inspected with regard to its present condition, removals, management, processes, and products will be found in Appendix 9.

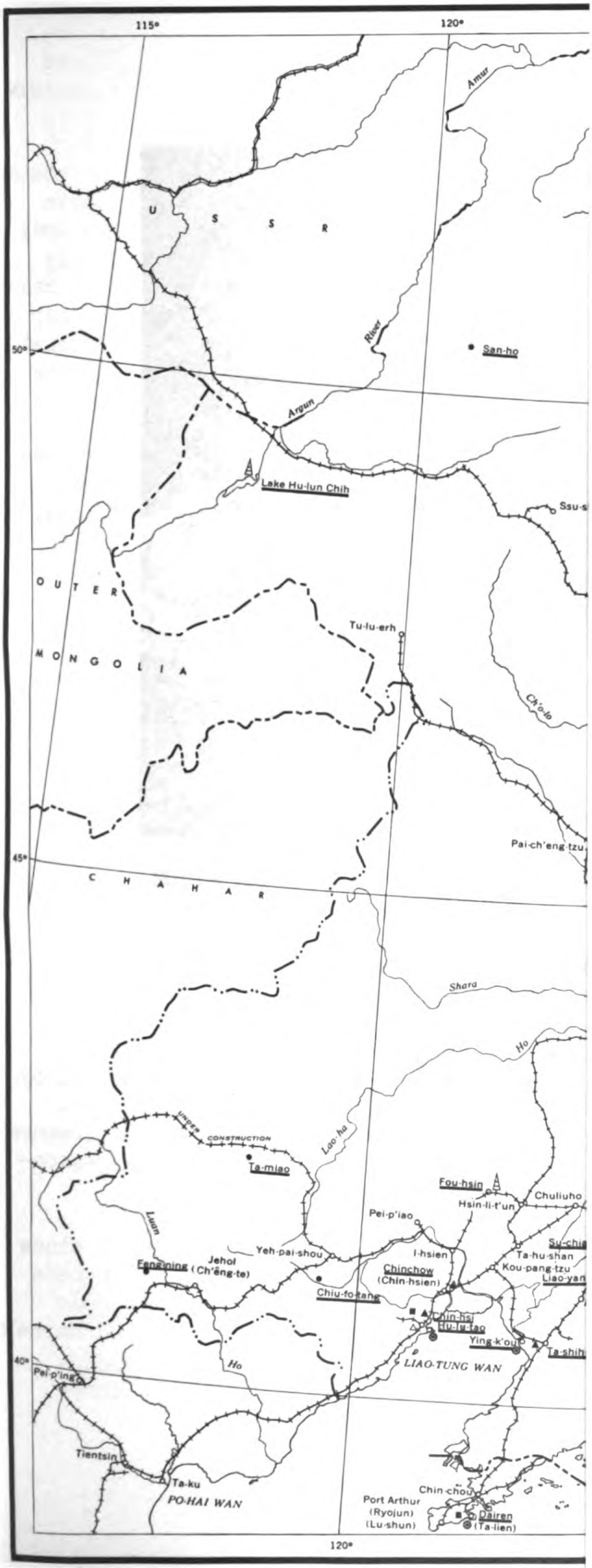
## B. INDUSTRIAL INSTALLATIONS

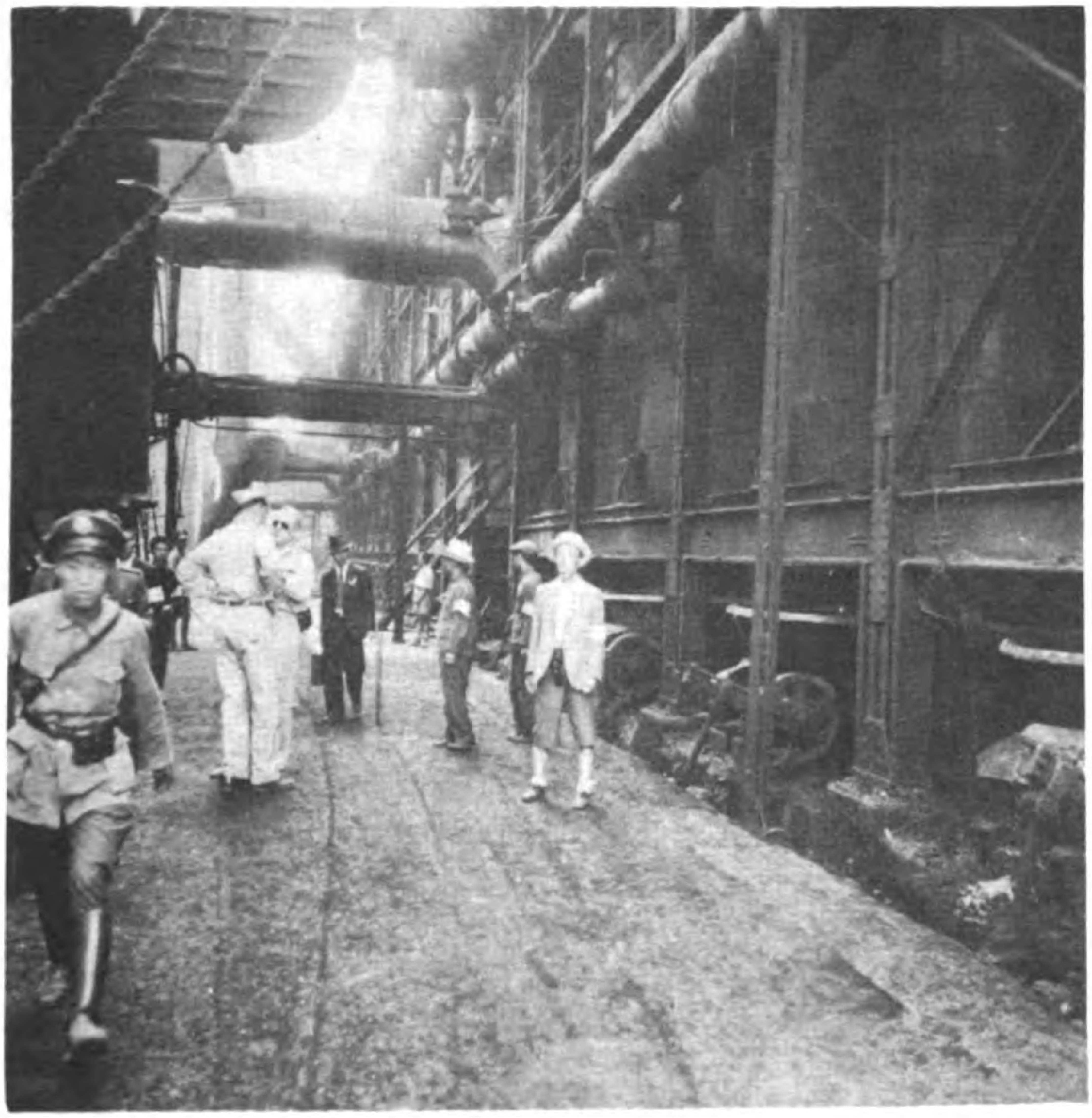
The liquid fuel plants had a total crude oil capacity of approximately 6,200,000 barrels a year, of which about 2 million barrels were oilshale extraction capacity, 1.5 million barrels capacity from coal synthesis, and 2.7 million barrels were petroleum refining capacity.

### 1. Oil-Shale Plants

The crude oil capacity of the oil-shale plants is estimated by various sources to be from 1,000,000 to 3,500,000 barrels per year. Based upon the number and capacity of retorts, and giving due allowance for down-time, an estimate of two million barrels a year seems reasonable.

The West Oil-Shale Plant at Fushun has been in operation since 1929, producing petroleum substitute products from the oil-shale beds that overlay the coal beds at the open-pit mine. In 1934 the crude oil capacity of the plant was doubled to 150,000 tons (1,050,000 barrels) per year, and about 1942, 60 additional retorting units were added. In 1944 a new plant, consisting of sixty 150-ton retorts, was con-


115°
120°
Amur
U S S R
River
San-ho
50°
Argun
Lake Hu-lun Chih
Ssu-s
O U T E R
M O N G O L I A
Tu-lu-erh
Ch'o-lo
Pai-ch'eng-tzu
45°
C H A H A R
Shara
Ho
UNDER CONSTRUCTION
Lao-ha
Ta-miao
Fou-hsin
Chuliuho
Hsin-li-t'un
Pei-p'iao
Luan
Su-chia
Yeh-pai-shou
I-hsien
Ta-hu-shan
Kou-pang-tzu
Jehol
Feng-ning
(Ch'êng-te)
Chinchow
(Chin-hsien)
Liao-yan
Chiu-fo-tang
Chin-hsi
Hu-lu-tao
Ying-k'ou
Ta-shih
LIAO-TUNG WAN
40°
Ho
Pei-p'ing
Tientsin
Ta-ku
PO-HAI WAN
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
120°



**SOUTH MANCHURIAN RAILWAY COMPANY OIL SHALE PLANT
AT FUSHUN**

View of a battery of retorts for distilling the oil from the shale.

structed at the East Oil-Shale mine near Fushun, bringing the total crude-oil capacity of the plant to over two million barrels per year, which made this installation the largest oil-shale operation in the world. Although the new plant never reached full-scale operation and the other plants did not operate at capacity, the oil-shale plants yielded 88 per cent of the total liquid fuels in 1943, 84 per cent in 1944, and when the war ended, were producing over 95 per cent of the total fuels produced in Manchuria. No other oil-shale plant had been built in Manchuria, although plans were made to construct a plant to retort the high-oil-content shales (15.5 per cent) located near Hustien, Kirin Province.

According to reports from the company's Tokyo office, the West Plant produced almost at capacity in 1943, when 1,317,300 barrels of shale oil was obtained. The production of both plants, according to the best estimates available, dropped to 904,000 barrels in 1944, of which 220,000 barrels were from the New East Oil-Shale Plant. They had produced to August 15 during 1945, 763,000 barrels of oil which was again about equal to the 1944 rate and is probably representative of the true producing capacity of the plant as of August 15, 1945.

The oil-shale plant at Hustien is reported to be in the experimental stage consisting of an "Inabe" retort and a "Fushun" retort in the process of construction. The quantity of oil produced during the experimental program was negligible.

The capitalization of the two Fushun plants is reported by the Tokyo office to be 120,000,000 yen for the West plant and 240,000,000 yen for the East plant. On the basis of 4.25 yen to the dollar, the capitalization of the two plants is equivalent to $84,500,000. The higher capitalization of the East Plant which has only about one-half the capacity of the West Plant, may be justified inasmuch as it contains mining and transporting facilities not included in the West Plant, where the mine is operated by the coal industry.

Although the West Oil-Shale Plant suffered very little damage from removals and no destruction or looting, and is capable of operation at full capacity with a few minor replacements, the open-pit mine from which the oil-shale is obtained was made practically inoperable due to removal by the Soviets of electric shovels and other mining machinery. The Northeast Chinese Economic Commission estimated that the capacity of the plant was reduced 65 per cent by these removals. (For details of the mining operations see Plant Inspection Report 1-B-4, in Appendix 4.) Based on an estimated 65 per cent reduction in production from the 1943-44 rate, the present capacity of the West Oil-Shale Plant should be about 450,000 barrels of oil per year. The plant is not operating at present due to lack of shale and electric power.

Because the East Oil-Shale Plant was held by the Chinese Communists during the period the Pauley Mission was in Manchuria, the plant was not inspected. Rumors to the effect that the mining machinery had been removed by the Soviets and that the retorting and refining plant had been badly damaged could not be verified; so it is assumed for the purpose of estimating present capacity that the loss in capacity was the same percentage as that of the West Plant. Thus the capacity of the East Plant may have been reduced from 708,000 to about 250,000 barrels per year. The present crude-oil capacity of the Fushun Oil-Shale Plants, under this assumption, should be about 700,000 barrels a year. For additional information, see Plant Inspection Report 1-I-18 in Appendix 9.

The value of the equipment removed from the West Plant, excluding that from the mine (included in report on Fushun Open-Pit Mine) probably does not exceed $50,000. The value of removals from the East Plant is unknown and therefore has not been included in the total estimated dollar loss to the industry.

## 2. Petroleum Refining Plants

The largest petroleum refining plant, and the only one devoted entirely to petroleum refining, is that of the Manchurian Petroleum Company located at Dairen. This plant was capitalized at 72 million yen, equivalent to about 17 million dollars, and had a crude-oil capacity of approximately 1,087,000 barrels per year. The plant was built in 1935 by the Manchurian Government and Japanese interests allied with the Japanese oil monopoly. Prolonged negotiations to obtain permission for the Pauley Mission to enter Dairen were unsuccessful; so it was impossible to inspect this plant. However, what is believed to be a fairly reliable Japanese report, "Fuel Industries in Manchuria", (Source File 303-E-2-1) indicates that only the wax-processing part of the refinery was removed; consequently, the crude oil refining capacity of the plant would not have been substantially changed. No dollar value has been placed on possible losses by the plant in the final total estimates.

The Japanese Army 2nd Fuel Depot at Chinhsi contains a 3000-barrel-per-day pipe still and fractionating unit, a 700-barrel-per-day Dubbs-type thermal cracking unit, a continuous sulfuric acid treating unit, a Doctor treating unit and a re-run still which are intact except for electric motors and control equipment. It was reported that the Soviets removed the electric motors, belting, large machine tools and all laboratory equipment together with a large quantity of supplies and stocks, but that the control instruments were damaged by the local populace. Chinhsi is located near the port of Hulutao where a marine terminal was partially completed for the unloading, storage and pumping of crude oil to the Chinhsi plant. Two concrete storage tanks of 200,000-barrel capacity were completed and a small amount of construction had been done on a pumping station and pipeline to Chinhsi. Completion of the pipeline would be of great advantage to the continuation of petroleum refining operations there.

The estimate of the value of the removals and destruction to the petroleum units in the Chinhsi plant will be included with the remainder of the plant. It is estimated that the petroleum part of the plant could be put into operable condition, including the necessary control laboratory facilities and repair shops, for $250,000. Completion of the pipeline installation from Hulutao to the refinery should not cost more than $50,000. Additional information is in Plant Inspection Report 6-I-1 in Appendix 9.

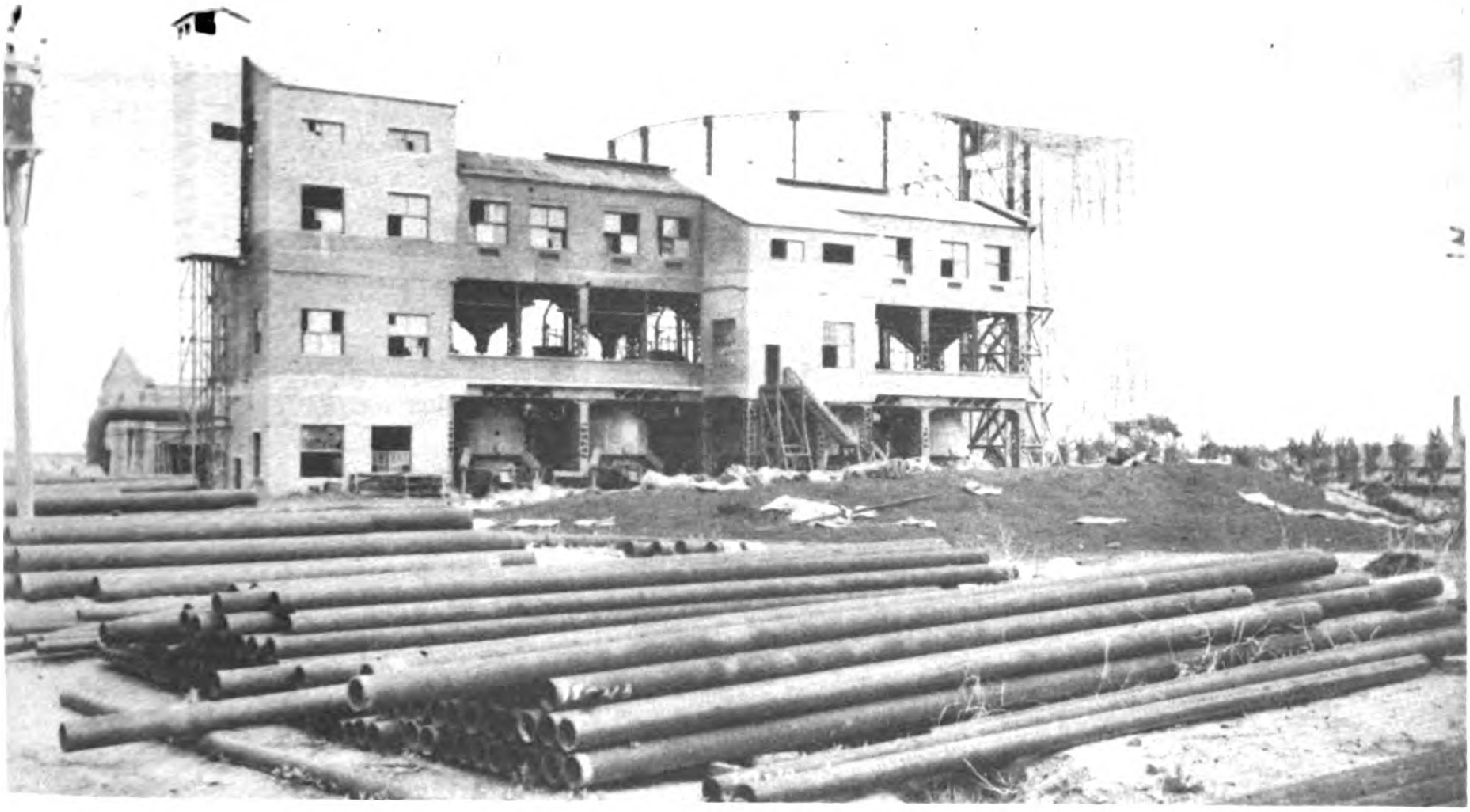
The Japanese Army 1st Fuel Depot at Ssupingchieh contains two crude-oil topping units of the Badger, type which may be used for topping crude oils. The smaller unit of 325 barrels-per-day capacity was operated since 1938 up to, and for a short period since, the end of the war. The larger unit, with a capacity of 2000 barrels per day, was being constructed and was practically completed. This plant could be used for processing crude oil for gasoline and heavier fuels but the plant contains little treating equipment or facilities for cracking or further refining crude oils. The main function of the plant was to hydrogenate crude-oil residues to aviation and motor gasolines. The location of the plant, about three hundred miles from ports into which crude oils could be imported, would necessitate rail transportation, which may be difficult under present congested traffic conditions.

Removals from the topping plants were relatively small; however, the removal by the Soviets of electric motors, some control instruments, machine tools, and all laboratory equipment would require replacement of many of these facilities before the units could operate.

The synthetic fuels portion of the plant consisted of equipment for producing and purifying hydrogen and high-pressure equipment for hydrogenating crude-oil residues obtained from the topping stills in this plant and from the refineries of Korea and Japan. No products other than aviation and motor gasolines are produced, the residues being recycled until the cracking and hydrogenating reactions are completed.

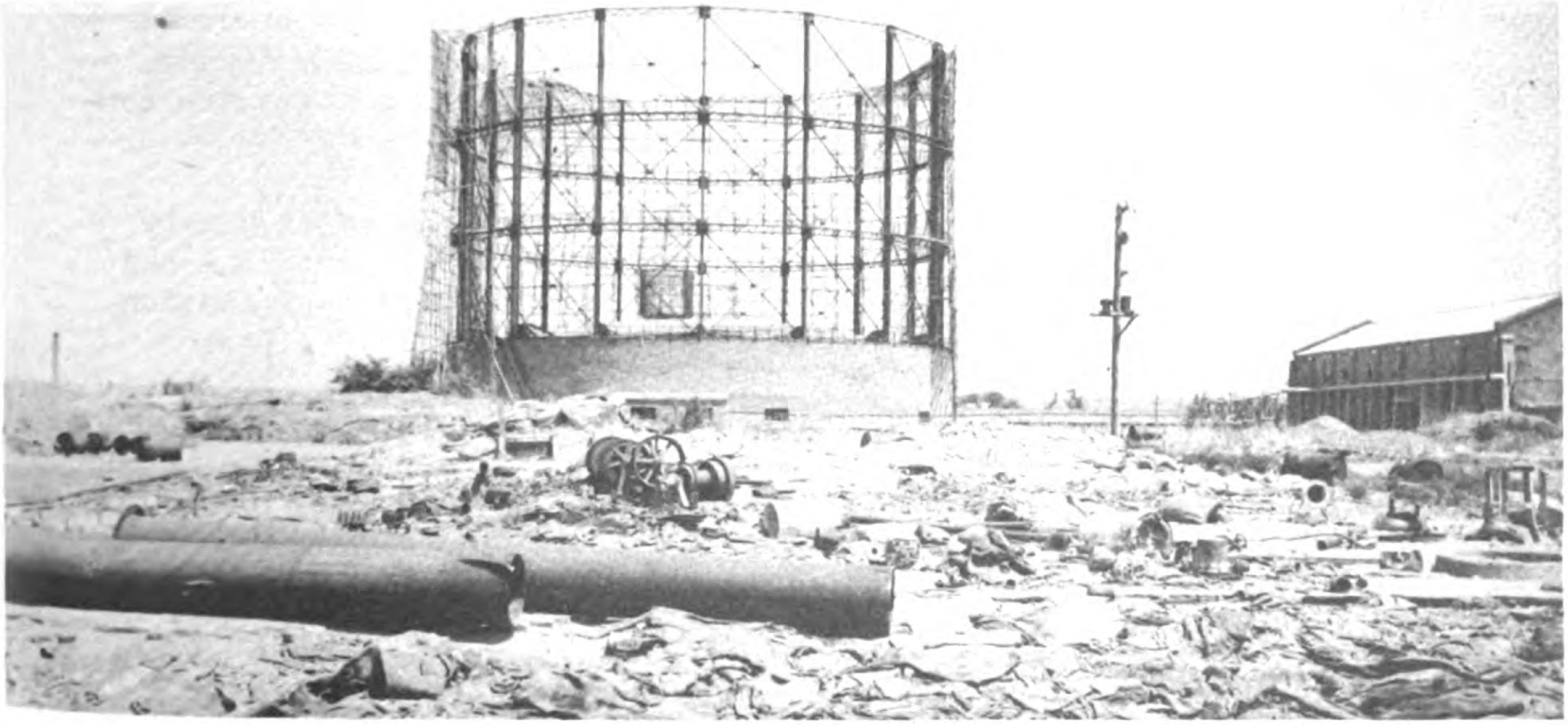
Hydrogen was obtained from the purification of water gas by the removal of carbon dioxide from the gas after carbon monoxide had been oxidized to carbon dioxide and by the cracking and purification of methane from plant gases.

Hydrogen and carbon monoxide gases were desulfurized and passed with steam through a carbon monoxide converter using iron oxide as the catalyst, where the carbon monoxide was oxidized to carbon dioxide, releasing hydrogen from the steam. The carbon dioxide was removed from the mixture by scrubbing with alkaline water. Methane was cracked to carbon dioxide and hydrogen at 600° C at substantially atmospheric pressure in the presence of steam and nickel sulfide on asbestos catalyst. The carbon dioxide was removed by the use of high-pressure alkaline water washers.

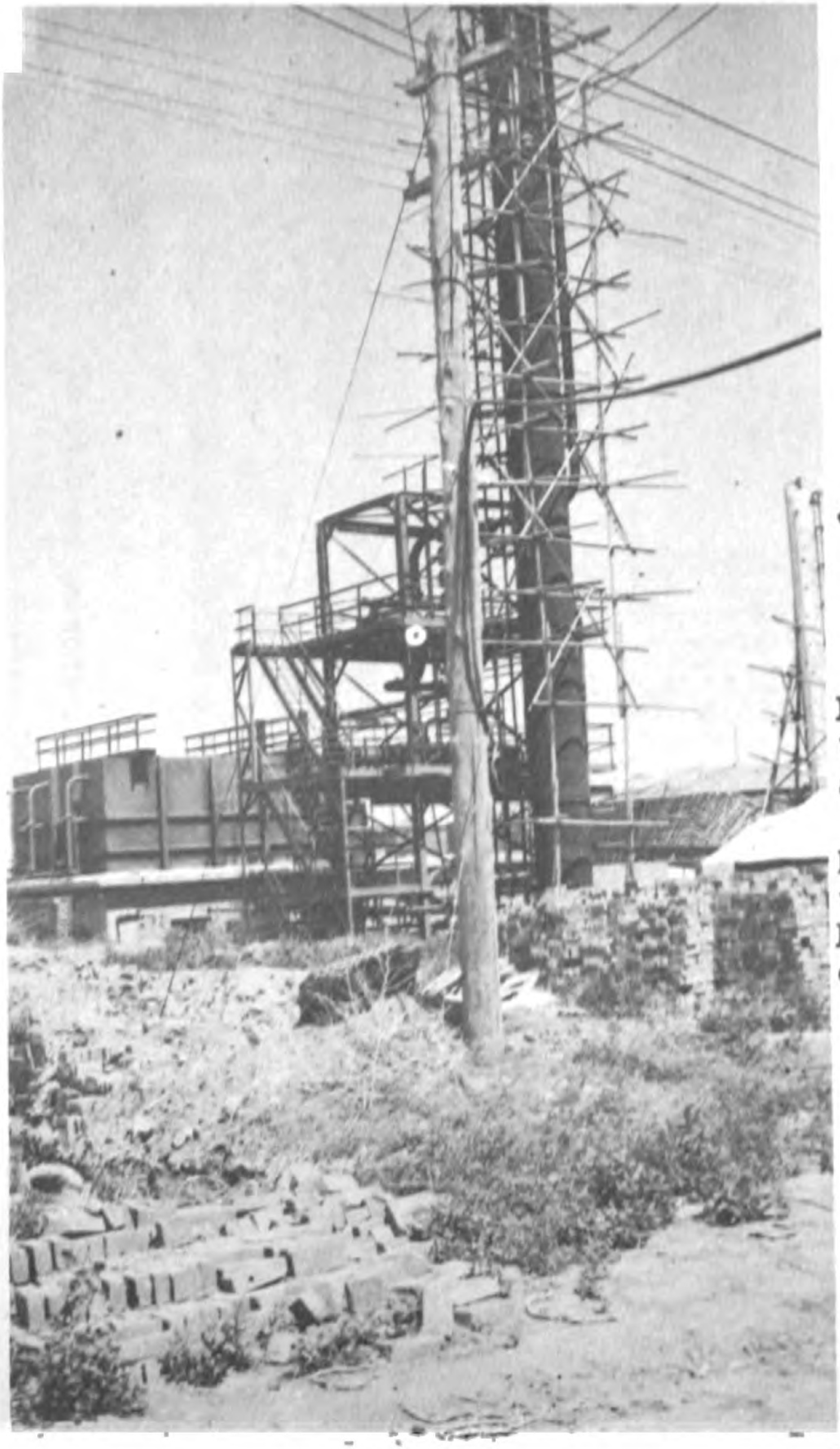


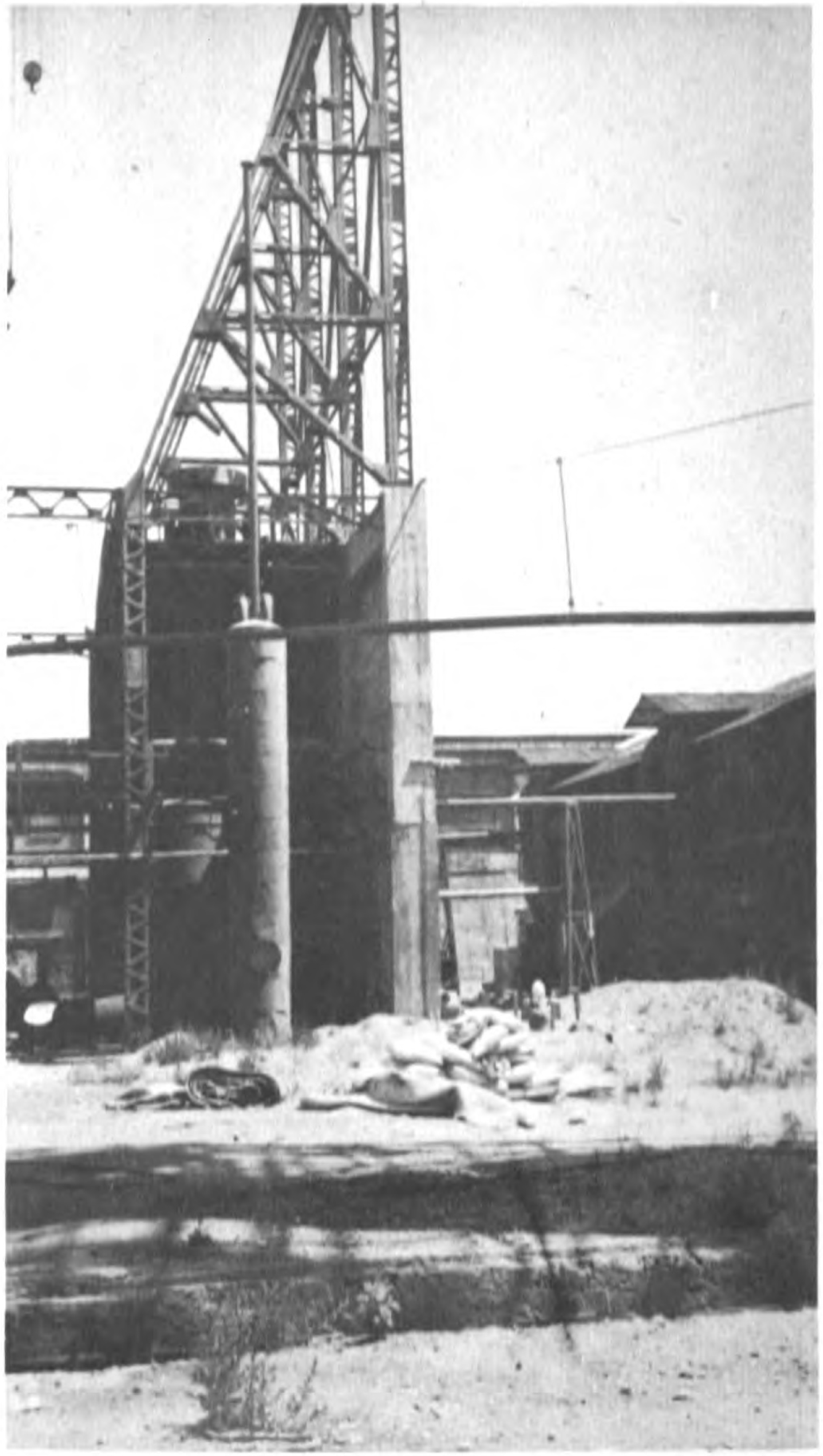
Japanese Army First Fuel Depot - Ssupingchieh

Gas producers and gasometer in the new plant.



Gasometer in new plant showing results of removals and looting.





JAPANESE ARMY FIRST
FUEL DEPOT --

Ssupingchieh

---

Left - Badger Fractionating Column and Still.

---

Right - Hydrogenation Reactors for hydrogenating crude oil residues.

The purified hydrogen and petroleum residues were reacted at 200 atmospheres pressure and 400-450° C in a reaction chamber in the presence of a molybdenum sulfide catalyst on acid clay.

The plant consisted of an older part which had been in operation since 1938 and a new part which was under construction. The new plant is said to have been considerably improved in design and operating technique. It was to have a capacity of 625 barrels per day of gasoline, as compared to 180 barrels per day for the old plant.

An alcohol unit was separate from the remainder of the plant. Ninety-five per cent alcohol was manufactured by distillation and rectification of native wines.

The Ssupingchieh plant was owned and operated by the Japanese Army and all records were destroyed by them at the end of the war. Inasmuch as the plant was not capitalized and plant costs are not available, an estimate of 12 million dollars for the value of the equipment and facilities in the plant would seem reasonable. The removals, estimated at about 10 per cent of the original value, are $1,200,000. For details, see Plant Inspection Report 19-E-1 in Appendix 9.

Production in this plant of aviation and motor gasoline by combination topping of crude oils and hydrogenation of residues is reported to have been 6,240 barrels in 1943, 6,175 in 1944, and 5,500 in 1945. The proportion of straight-run gasoline represented in these production data is not known.

The crude-oil source for the topping operations was reported to be Borneo. About 100 tons of this crude oil remains in storage at the plant, 400 tons having been distilled since August 15, 1945. Crude-oil residues used for hydrogenation were obtained from Japanese and Korean refineries. All of the products of the plant were used by the Japanese Army prior to the end of the war.

### 3. Synthetic Fuels

During the period 1938 to the end of the war, the Japanese completed, or had in the process of construction, seven plants to produce synthetic fuels from coal. These plants were of various types ranging from the simple manufacture of low-temperature tars and the fractionation of the tars into benzol and heavier products to the manufacture of carbon monoxide and hydrogen and the synthesis of these compounds into light liquid fuels by the Fischer-Tropsch process.

These plants produced only 20,700 barrels of fuel in 1943, equivalent to 1.4 per cent of the total fuels produced in Manchuria. Their 1944 production was 59,600 barrels, or about 5.5 per cent of the total fuels. The 1945 production is not known definitely but it probably was at about the same rate as in 1944, which would be equivalent to about 40,000 barrels up to August 15.

### (a) Fischer-Tropsch Plant

The Chinchow plant was constructed after German design, using German-manufactured equipment. Construction was started in 1936, but was not sufficiently complete to put part of the units into operation until late in 1943. The length of the construction period was stated to be due to difficulty of transportation of the equipment from Germany. The plant operated only from May to November 1944 and produced a total of 140 kiloliters (910 barrels) of products. The operation was said to be unsatisfactory due to leakage of air into the synthesis gas-producing ovens and the short life of the cobalt catalyst used in the synthesis reactors.

The process was similar to the German Fischer-Tropsch method adapted to Manchurian (Fouhsin) coal in which carbon monoxide and hydrogen are produced from the coal, treated to remove sulfur-bearing constituents, then combined under the proper temperature and pressure conditions with the aid of a catalyst to produce liquid products. The products from this plant were to be gasoline, diesel fuel and wax.

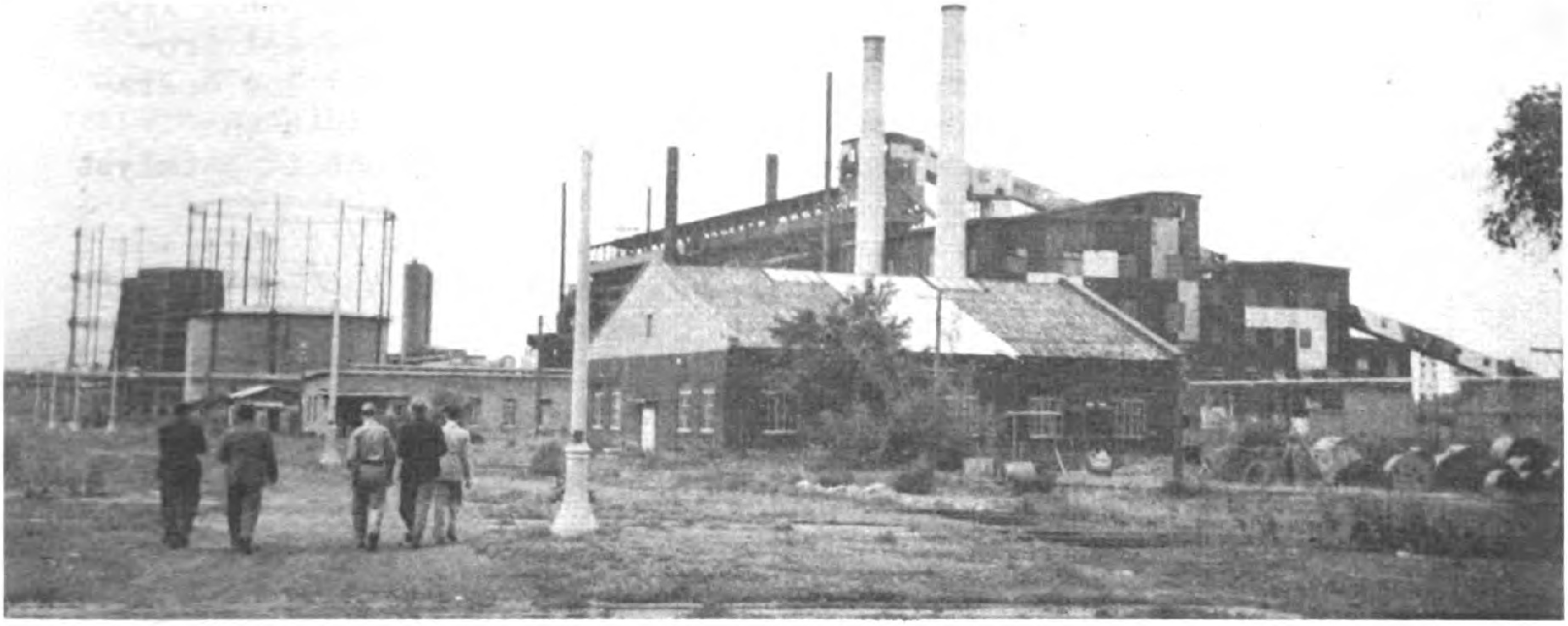
Briefly, the processing system in this plant consisted of passing 1/4 to 1-1/4 inch mesh coal through Didier ovens to produce synthesis gas consisting of carbon monoxide and hydrogen gases in the ratio 1:2. The Didier installation consisted of 96 ovens, 48 of which had been put into operation; the remaining 48 were in the process of being heated when the war ended. The carbon monoxide and hydrogen were passed through a purifying system consisting of iron oxide and iron-oxide and sodium-carbonate towers to remove inorganic and organic sulfur compounds which, if left in the gases, would poison the catalyst. The purified gases were reacted at 200° C at substantially atmospheric pressure in the presence of a special cobalt-oxide catalyst to produce liquid hydrocarbon synthetic crude oil. The heavy portion of the crude oil was condensed and the lighter portion absorbed by activated charcoal and subsequently removed by superheated steam and condensed. These liquid products were to have been refined at the Chinhsi Army Fuel Depot.

The plant, owned by the Synthetic Fuel Company, Inc., was capitalized at 100,000,000 yen, reportedly subscribed as follows:

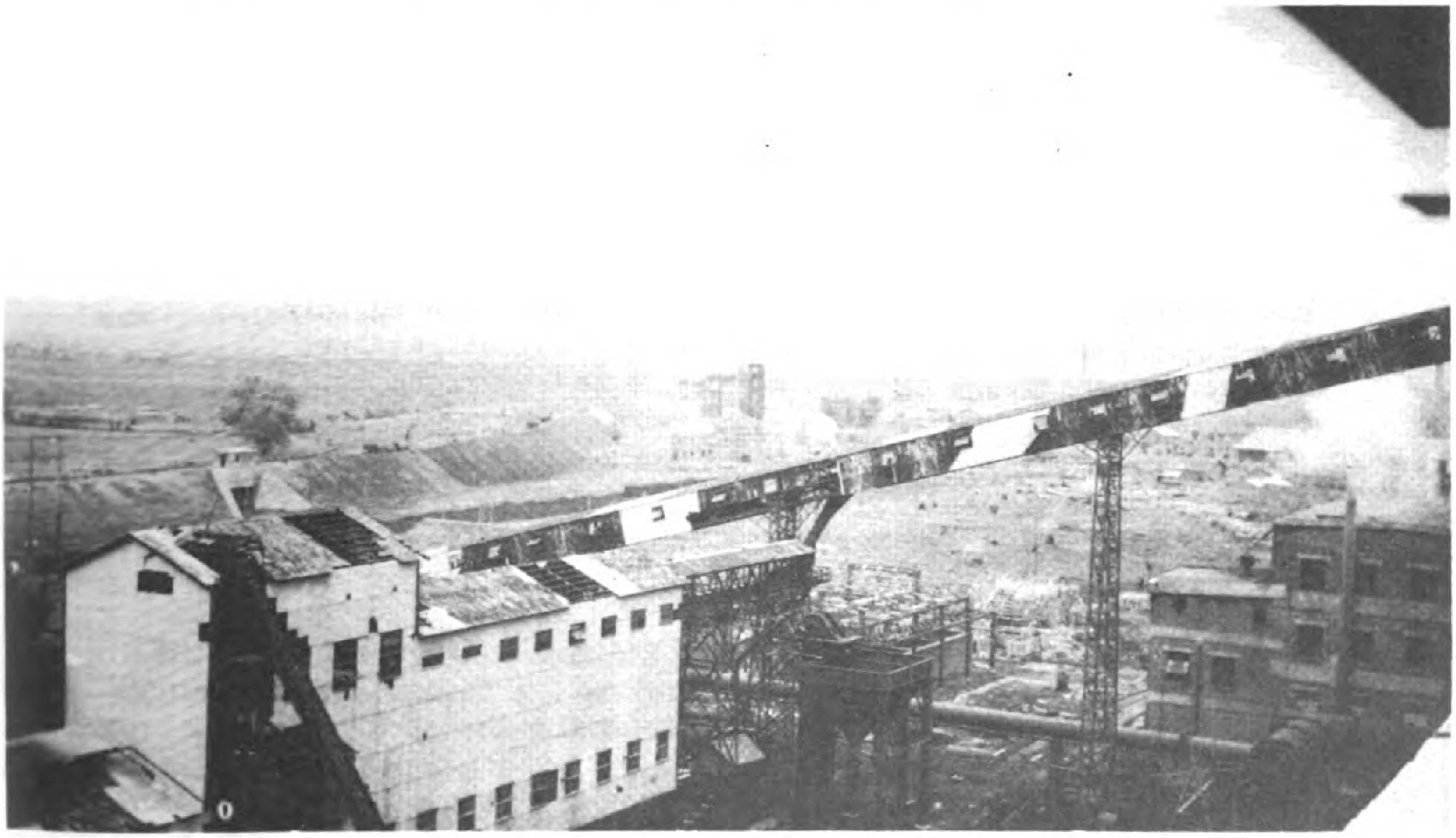
| | |
|---|---|
| Manchukuo Government | 34,000,000 yen |
| Mitsui Companies | 34,000,000 yen |
| Tiekoku Nenryo Kogyo Co. | 26,000,000 yen |
| Manchu Oil Co. | 3,000,000 yen |
| Fouhsin Coal Mining Co. | 3,000,000 yen |

Of this capitalization, 90 million yen was paid up and 21,750,000 yen was borrowed, 16,000,000 from the Teikoku Nenryo Kogyo Company and 5,750,000 from the Manchu Kazzo Bank.

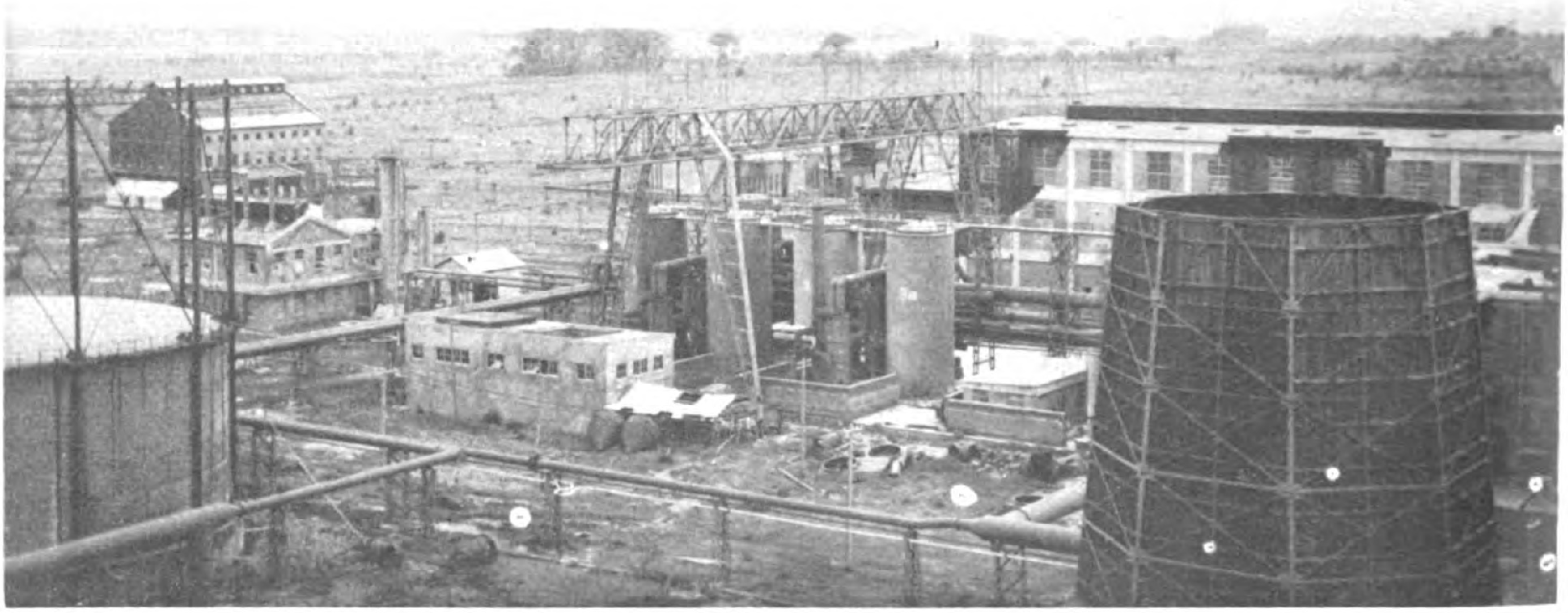
The removals of equipment by the Soviets from this plant consisted primarily of machine tools, laboratory equipment, some



Synthetic Fuel Co., Ltd. - Chinchow
General view of the plant showing Didier Furnaces and coal changing belt in the right background and gasometers on the left - Fischer-Tropsch Process.



Crushing and screening house and belt conveyor to the Didier Furnaces.



SYNTHETIC FUEL CO., LTD. - CHINCHOW

Synthesis gas purification system in center. The building in the right background houses the Fischer-Tropsch catalyst chambers for converting carbon dioxide and hydrogen to liquid fuels.

electric motors, belting, and miscellaneous supplies. The Northeast Chinese Economic Commission estimates the value of the removals at $104,686. The major part of the control instruments was reported to have been destroyed by the Japanese at the end of the war.

It is estimated that the units in the plant that had been in operation could be put back into operable condition, including instrumentation and laboratory and shop facilities, for $200,000. However, the feasibility of restoring this plant is extremely doubtful, except possibly for experimental purposes, for it never operated satisfactorily and cost of Fischer-Tropsch synthesis under the most satisfactory conditions is several times that of producing equivalent fuels from petroleum or even from oil shale. For further details, see Plant Inspection Report 23-E-1 in Appendix 9.

(b) Japanese Army Second Fuel Depot, Chinhsi

In addition to the petroleum refining facilities previously described and synthetic lubricating oil plant which will be described later, the Chinhsi plant contains a low-temperature carbonization unit, gas-producer plant, iso-octane plant, ethyl alcohol plant, electrolytic hydrogen generators, a drum manufacturing plant, and auxiliary facilities, such as power plant, laboratories and shops. For a detailed description of each of these units see the Plant Inspection Report 6-I-1 in Appendix 9. Of the above processing units, only the LTC, gas producer, and electrolytic hydrogen plants were completed. The remainder were in various stages of construction.

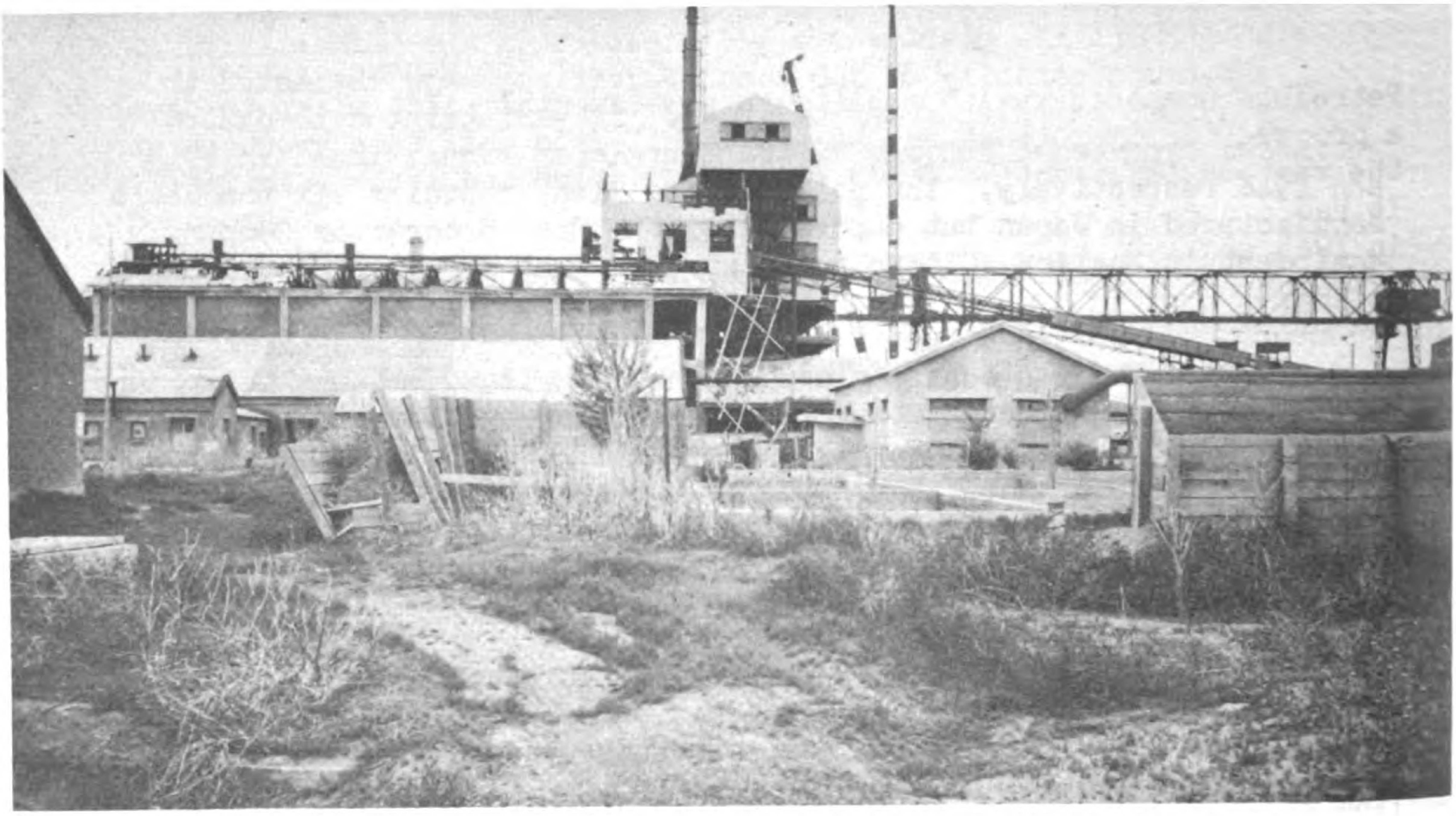
The LTC plant was a modification of the German Lurgi type. It had a capacity of 300 tons of coal per day, estimated to produce 39,000 barrels of tar per year. It was operated about two years and produced 8,000 and 22,000 barrels of liquid fuels in 1943 and 1944 respectively. The gas producer plant contains six producers manufactured in Japan but copied after the Gas Corporation Company equipment in England. These units produced gas for heating the LTC plant.

The iso-octane plant was not completed but was to produce pure iso-octane by dehydrating and isomerizing butyl alcohol to butylene and isobutylene, then alkylating to di-isobutylene and hydrogenating to iso-octane. Hydrogen for the hydrogenation was to be produced by electrolysis of water. The electrolytic plant was completed and contained 432 cells capable of producing 800 cubic meters of hydrogen a day.

The ethyl alcohol plant was to produce 65,000 barrels of absolute alcohol annually, by fermentation of grain, followed by fractionation and dehydration. Construction was nearing completion but the plant had not operated.

**Japanese Army Second Fuel Depot - Chinhsi**

Above - general view of plant showing petroleum refining equipment in right background.



**Low-temperature-Carbonization Plant**

The plant to manufacture drums and cans for packaging products was also near completion but had not operated. A modern power plant capable of producing 15,000 KVA of electricity was partly completed. The first of two boilers was practically completed and the turbo-generator was in place.

Inasmuch as this plant was constructed and operated by the Japanese Army, no capitalization value is available. The total value of the equipment, buildings and construction is estimated at $15,500,000 of which the Northeast Chinese Economic Commission estimates $3,131,344 worth of equipment was removed or destroyed by the Soviets and an additional $2,369,360 worth of materials and supplies were taken. A complete list of the equipment and supplies removed by the Soviets is given in Source File 202-E-1.

This plant was constructed essentially for war purposes, and consequently it would be uneconomical to operate most of its units, with the exception of the petroleum refinery and possibly the power plant and ethyl alcohol unit. The possibility of converting the high-pressure and hydrogenation equipment into an ammonia synthesis plant might be considered. Cost of the restoration of the plant will depend upon those units that are to be restored andmay range from $300,000 for the petroleum refinery to $3,000,000 if the entire plant is restored. The Northeast Economic Commission has not evolved a definite plan for restoration of this plant but seems to favor restoration of the petroleum refinery immediately.

### (c) Coal Tar Hydrogenation, Fushun Plant

This plant, owned and operated by the Manchu Synthetic Petroleum Company, was in reality an experimental pilot plant to develop a process for hydrogenating the middle oil from coal tars produced at the various LTC plant in Manchuria, to aviation and motor gasoline. It had a capacity of 130,000 barrels of products a year. It produced in 1943 and 1944, 12,700 barrels and 28,300 barrels respectively, of aviation and motor gasolines, which were utilized for military purposes. The plant produced 500 barrels of synthetic methanol during 1945.

The Manchu Synthetic Petroleum Company was reportedly capitalized at 23,527,000 yen ($5,500,000 at 4.26/1) to investigate the manufacture of synthetic gasoline from coal tars. The actual cost of equipment at the Fushun plant is not known but is estimated at about $150,000. The Soviets removed 500 tons of equipment valued at $51,677, and $79,000 worth of supplies and materials. The removed equipment consisted essentially of machine tools and shop equipment, electric motors, pumps, automobiles, and laboratory equipment.

The reduction in plant capacity due to removals was 100 per cent. Inasmuch as the estimated cost of producing synthetic gasoline was about 75 cents per gallon, it would not be advisable to restore the facilities for this type of operation. The plant could be converted into synthetic ammonia production or synthetic methanol. The estimated cost of synthetic methanol is slightly over $2 per gallon, which would also make the restoration of this process appear inadvisable.

### (d) Coal Tar Hydrogenation, Kirin Plant

This plant was under construction by the Manchuria Synthetic Petroleum Company, Ltd., to produce synthetic oils, gasoline, semi-diesel and bunker oils, as well as synthetic methanol, wax and pitch by the process developed at the Fushun experimental plant. The plant had a planned capacity of 10,000 metric tons of low-temperature tar per year, 15,000 tons of methanol and 130,000 tons of semicoke or coalite. The LTC units were put into partial operation in 1944 and produced 8,400 barrels of coal tar and 18,900 tons of coalite. The remainder of the plant was never operated.

The Manchuria Synthetic Petroleum Company, Inc., was reported by Japanese Tokyo sources (Source File 9-E-1) to have been capitalized for 50 million yen and to have borrowed 11,400,000 yen. The stockholders were listed as follows:

| | |
|---|---|
| Manchurian Government | 17,500,000 yen |
| Teikoku Nenryo Kozzo Co. | 17,500,000 yen |
| South Manchurian Rwy. Co. | 15,000,000 yen |

The actual value of the equipment in the plant is estimated at $2,137,000, based on the estimated value of removed equipment. Ninety-five percent of the equipment was removed by the Soviets, reportedly valued at $2,030,545. The removed equipment consisted primarily of all movable auxiliary equipment in the boiler plant and low temperature tar furnaces, two 9000 KW steam turbine generators, gas compressors, pumps, motors, synthesis gas converters and purification equipment, laboratory and shop equipment, supplies and materials. Practically everything except towers, furnaces and buildings were removed by the Soviets. From its capitalization of ¥ 50,000,000 ($11,750,000 at 4.26/1) and additional borrowing of ¥ 11,400,000 ($2680,000 at 4.26/1) this plant must have had a total value of well over the estimates given by the sources listed in Plant Inspection Report 9-E-1 (Appendix 9). Therefore considering that the remaining equipment and buildings have been rendered permanently useless, the dollar loss to the Kirin plant has been placed at $4,000,000.

11750
2680
14,430,

The system of processing at this plant was to be similar to that developed at Fushun. Low-temperature tars produced by Lurgi-type carbonization furnaces from Jyako coal were fractionated into light and heavy oils and pitch. The heavy oils were further fractionated, dewaxed and treated to produce bunker fuels, semi-diesel oils and waxes. The coalite from low-temperature carbonization was to be used as the raw charge to Winkler gas generators to produce water gas which was in turn to be purified and reacted to produce synthetic methanol. A small experimental Fischer-Tropsch unit was also under construction in the plant to have had a capacity of 6,500 barrels a year of synthetic crude oil. The products were all to have been used for military purposes. For details see Plant Inspection Report 9-E-1 in Appendix 9.

Undoubtedly the cost of producing synthetic fuels and methanol by these processes would have been excessive, comparable to those obtained at the Fushun plant; the restoration of this plant for this purpose, therefore, seem inadvisable. During the short period of operation the cost of producing low-temperature tar was estimated as $0.71 per gallon and coalite at $1.83 per short ton. The present Japanese plant manager considers the plant suitable for the distillation of oil shale from the Huatien area to the extent of 6,000 tons per year, for the production of petroleum substitute products.

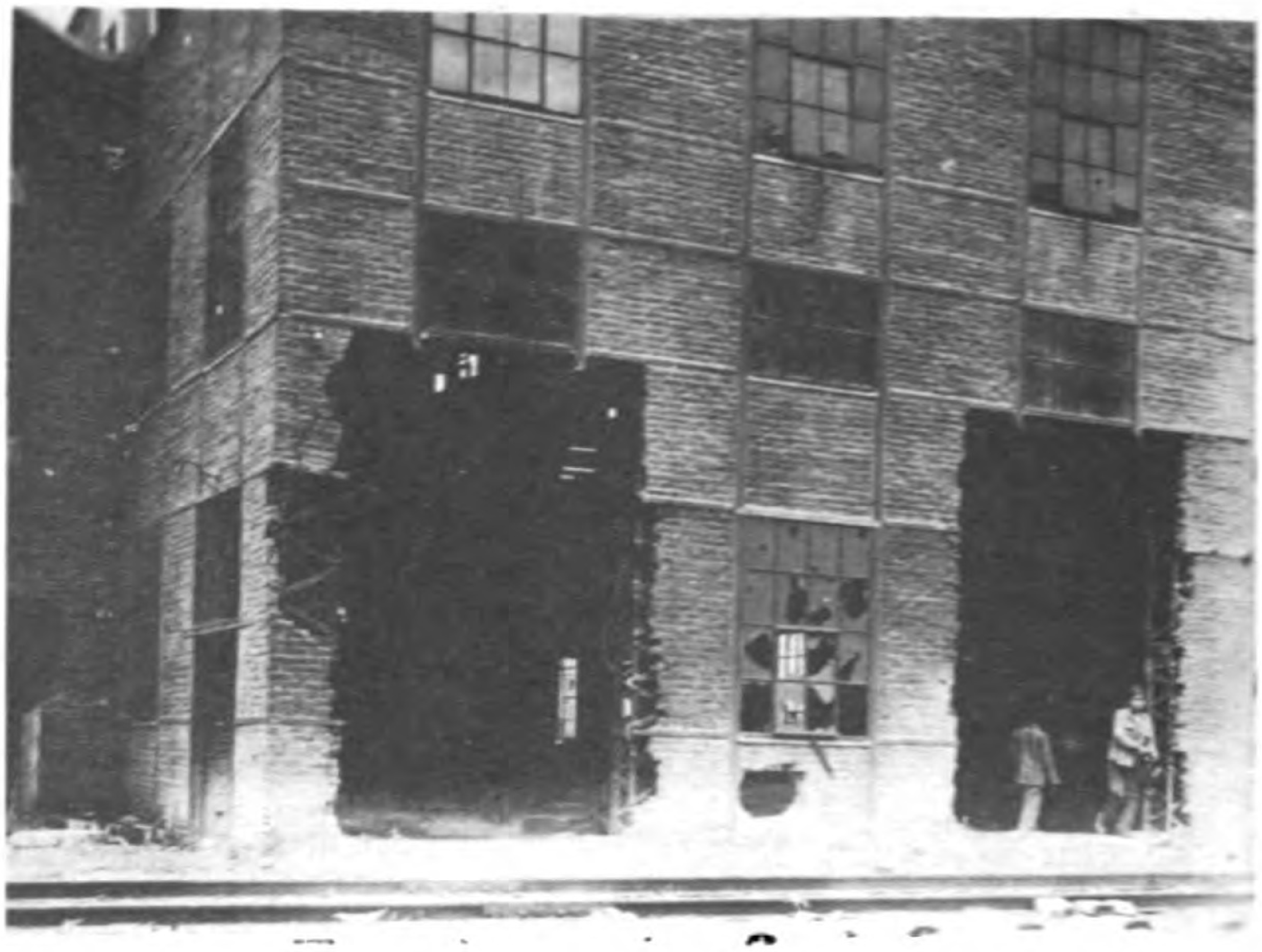
### (e) Manchu Research Institute for Coal Hydrogenation, Mukden

This plant was constructed according to German design and with German-manufactured equipment. Its purpose was to produce aviation gasoline for the Japanese military forces. The planned capacity was 13,000 barrels of aviation gasoline per year but the plant was completed in 1945 and was still in the testing stage when the war ended. The Soviets removed all equipment and the Japanese staff personnel.

No records of the plant design, operation or costs remain; so it was impossible to obtain specific information regarding these and other plant details. The value of the plant equipment, all of which was removed by the Soviets, was placed at approximately $200,000 by the Northeast Chinese Economic Commission. Considering installation cost, piping and accessories no longer of value, the total damage is estimated to be about $400,000. (The complete list of removals may be found in Source File 202-E-1). The total value of the plant, including land, buildings and auxiliary equipment, would probably be between $750,000 and $1,000,000. The funds for establishing this Research Institute were believed to have been provided by the Japanese Government.

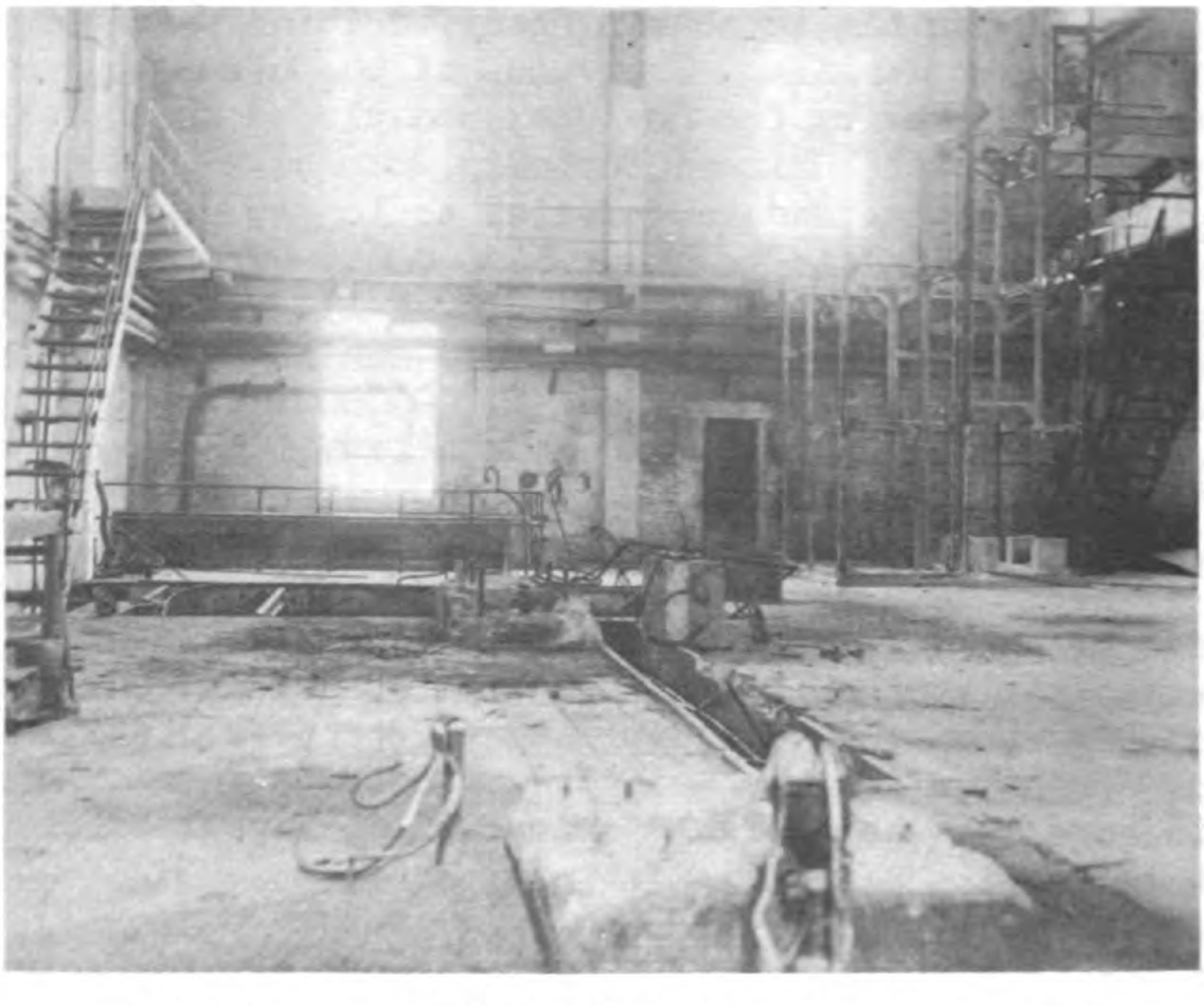
The process consisted of hydrogenation of low-temperature tars produced by the various LTC plants in Manchuria. The equipment consisted essentially of units for the manufacture and purification of hydrogen, high-temperature and pressure reactors, distillation and treating apparatus for the products. The details of the process were said to have been held highly secret. Additional information is in Plant Inspection Report 1-E-1 in Appendix 9.

It is highly probable that the cost of manufacturing gasoline by this process would be very high and, since the equipment



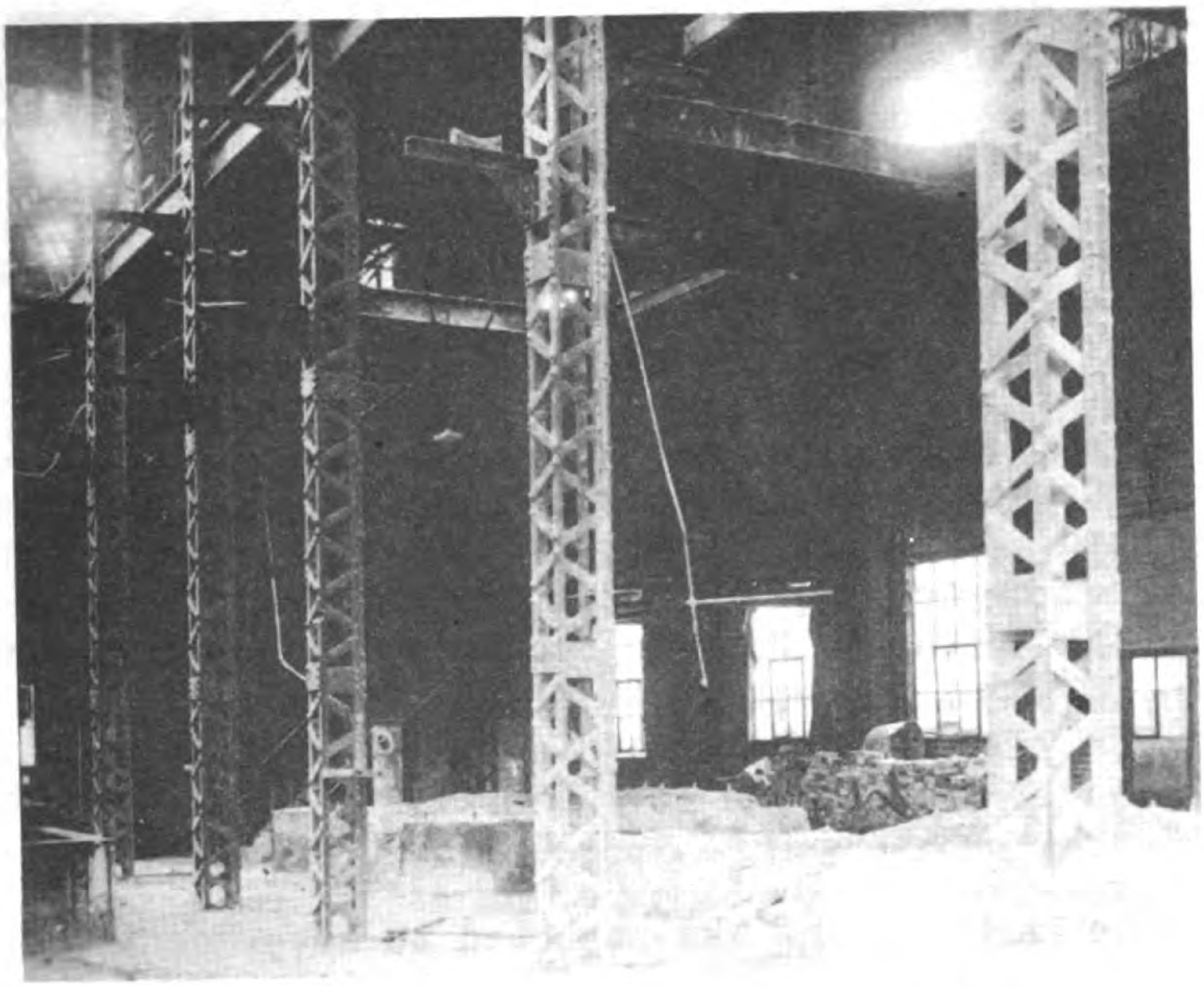
COAL HYDROGENATION RESEARCH INSTITUTE, MUKDEN

Openings made in building for removal of equipment.



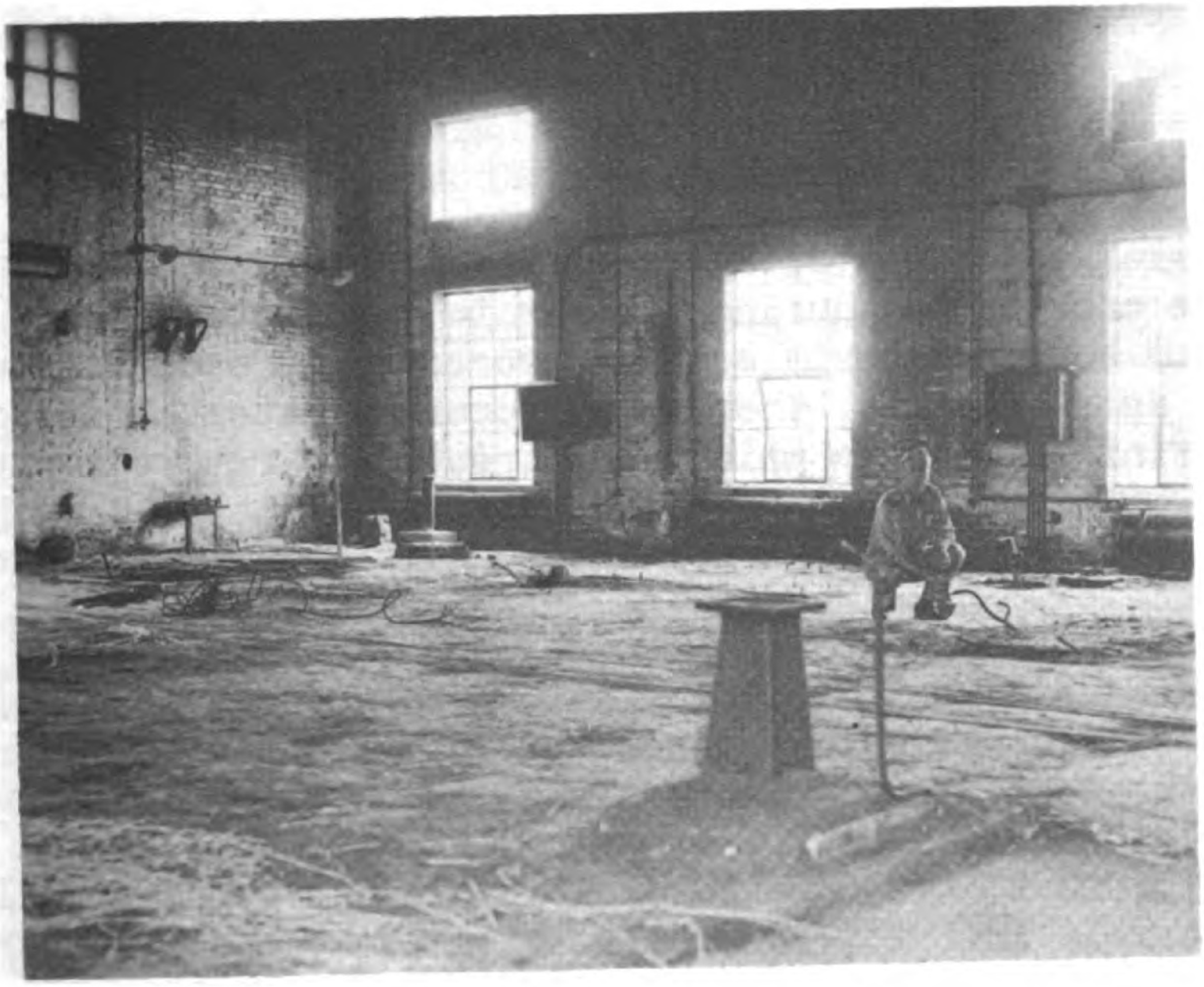
COAL HYDROGENATION RESEARCH INSTITUTE, MUKDEN

Interior of distillation building from which all apparatus had been removed.



COAL HYDROGENATION RESEARCH INSTITUTE, MUKDEN

Empty foundations from which high pressure compressors had been removed by the Soviets.



COAL HYDROGENATION RESEARCH INSTITUTE, MUKDEN

Plant machine shop which was completely stripped of all machinery. Photo shows one quarter of the floor area.

was manufactured in Germany and would be difficult or impossible to replace, restoration of the plant would seem inadvisable.

### (f) Low Temperature Carbonization Plants

Two LTC plants, one at Tashihchiao and the other at Harbin, were reported to be in the testing stage of completion at the end of the war.

The plant at Tashihchiao, constructed by the South Manchurian Mining Company, Ltd., was in Communist occupied territory and was not inspected. Japanese Source File 303-E2-1 reported the plant to have a planned capacity of 100,000 tons per year of low temperature tar; however, the Northeast Chinese Economic Commission reported its capacity at 6,000 tons per year. It was to operate by the "Takada" process for low-temperature carbonization, the details of which were not available. Also, no one in Nationalist territory knew whether the plant was still intact or if equipment had been removed.

The Harbin plant was reported to have been constructed by the Sietan Industry Company, Ltd., and was to process coal briquettes to produce a substitute for wood charcoal. Coal tar would have been produced during the process which would yield the normal coal-tar products. The plant was to have a capacity of 80,000 tons of charged briquettes per year. The yield of tar would probably have been about 4,000 tons per year. Nothing further was learned about this plant, as the Communist officials in Harbin knew nothing of its existence. The Northeast Chinese Economic Commission also made no report on this plant. The information regarding its existence and capacity was reported in "Report on Fuel Industries in Manchuria", Source File 303-E.2-1.

## 4. Synthetic Lubricants

Several small units, all parts of other types of industrial plants, were constructed during the war to manufacture lubricants from non-petroleum source materials. The processes in each case were practically the same, that is, the raw hydrocarbon material was cracked to produce olefinic compounds which were treated to remove impurities, polymerized with the aid of metallic choloride catalysts and finally the polymerized oils were fractionated, under reduced pressure, into suitable vicosity-range lubricants.

At Mukden, the S.M.R. Chemical Factory contains a unit in which crude shale-oil paraffin is synthesized into a steam cylinder lubricant for use by the South Manchurian Railway. Zinc chloride was used as the polymerization catalyst. It was constructed in 1941 and had a capacity of 3,000 to 4,000 barrels of lubricants per year. It produced 195 barrels in 1943, 3300 barrels in 1944, and 1100 barrels in 1945. No removals or damage occurred during Soviet occupation and the plant is in an operable condition. Further details regarding the operation of the unit are given in the Plant Inspection Report 1-E-2 in Appendix 9.

The Japanese Army Second Fuel Depot at Chinhsi contains a unit under construction to produce synthetic lubricants from soya bean fatty acids, using the same process with zinc oxide and zinc chloride as catalysts. This unit was to have had a capacity of 39,000 barrels of lubricants a year. Further details are given in the Chinhsi Plant Inspection Report 6-I-1, in Appendix 9.

The S.M.R. West Oil-Shale Plant contains a unit in which shale-oil light oils are used as the charging stock and aluminum chloride is used as the catalyst. The capacity of the unit was about 20,000 barrels of lubricants a year. Production in 1943 was 13,143 barrels; in 1944, 4,823 barrels; and in 1945, 8,000 barrels. There were no removals or damage to this unit.

No information was available regarding the cost of producing synthetic lubricants by this process except the Japanese technologists said it was "very high". The quality of the lubricants appeared satisfactory, but were said to be inferior to high-grade petroleum lubricants. The operation of these units would seem inadvisable because of the high costs involved.

## D. ECONOMIC SUMMARY

From the economic standpoint, the synthetic-fuel processes were definitely failures. The cost of manufacture of the various fuels, based on operating costs alone, ranged from 0.3 yen (7 cents) per gallon for low-temperature tars to 19.7 yen ($4.62) per gallon for gasoline produced by hydrogenating crude oil residues at the Ssupingchieh Army Fuel Depot. The cost of gasoline produced at the Dairen petroleum refinery was estimated at 2.3 yen (54 cents) and the gasoline produced from oil-shale at Fushun was estimated to cost 2.8 yen (65 cents) per gallon.[1] Thus, the cost of manufacturing gasoline from oil-shale was not greatly more than that from imported petroleum. However, the cost of mining shale at the Fushun open-pit was charged to coal operations and not to oil-shale operation, for it was necessary to remove the oil-shale overburden whether the oil-shale was processed or not.

## E. SOVIET REMOVALS

As a result of the Soviet occupation in Manchuria and their removals of machinery and equipment, the liquid fuels and lubricants industry suffered an estimated total loss of $11,380,000 and a reduction in capacity of about 75 per cent. Table E-1 gives a recapitulation of these removals, as well as information on capitalization and production.

---

1/ Converted to US dollars at 4.26 yen to 1 dollar.

Table E-1

## LIQUID FUEL PLANTS OF MANCHURIA

| Company | Location | Capital-ization (000 $)* | Capacity (000 bbl/yr) | Production 1943 (000 barrels) | Production 1944 (000 barrels) | Production 1945 (000 barrels) | Reduction in Capacity due to Soviet Removals (per cent) | Estimated Value of Removals (000 $)* |
|---|---|---|---|---|---|---|---|---|
| Oil-Shale Plants: | | | | | | | | |
| SMR Oil-Shale Plant (West) | Fushun | 28,200 | 1,337 | 1,317.3 | 694.1 | 644 | 65 | 50 a/ |
| SMR Oil-Shale Plant (East) | Fushun | 56,300 | 708 | - | 210 | 119 | unknown | unknown |
| Manchuria Coal Co. (Oil-Shale Plant) | Hautien | - | - | not in operation | | | unknown | unknown |
| Petroleum Refineries: | | | | | | | | |
| Manchurian Petr. Co. | Dairen | 17,000 | 1,087 | 40.6 | 86.5 | 25 | unknown | unknown |
| Japanese Army 2nd Fuel Depot | Chinhsi | b/ | 900 | 118 | 13 | - | 50 | b/ |
| Japanese Army 1st Fuel Depot | Ssupingchieh | 12,000c/ | 700 | 6.2 | 6.2 | 5.5 | 50 | 1,200 |
| Synthetic Fuels: | | | | | | | | |
| Synthetic Fuel Co.Ltd. | Chinchow | 23,500 | 210 | - | 0.9 f/ | - | 60 | 100 |
| Japanese Army 2nd Fuel Depot - | Chinhsi | | | | | | | |
| Low-Temp. Carbon | | 15,500 d/ | 39 | 8 | 22 | - | 50 | 5,500 |
| Iso-octane | | | 260 | not in operation | | | | |
| Manchu Research Institute for Coal Hydrogenation | Mukden | 1,000 g/ | 13 | not in operation | | | 100 | 400 |
| Manchuria Synthetic Petroleum Co. Ltd. | Kirin | 11,750 | 100 methanol<br>67 L.T. tar | - | 8.4 | - | 100 | 4,000 |
| Manchu Syn.Petr.Co. | Fushun | 5,500 | 130 e/ | 12.7 | 28.3 | - | 100 | 130 |
| South Manchurian Mining Co. Ltd. | Tashihchiao | - | 700 (Est.) | not in operation | | | unknown | unknown |
| Sietan Ind.Co.Ltd. | Harbin | - | 28 | not in operation | | | unknown | unknown |
| TOTAL | | 170,750 | 6,279 | 1,502.8 | 1,069.4 | 793.5 | 75 | 11,380 |

* Converted at rate of 4.26¥ to $1

a/ Major removals were from mine and have not been included in this figure.

b/ Included in total for plant, shown under Synthetic Fuels.

c/ Estimated value of equipment and buildings.

d/ Estimated value of equipment and buildings; including petroleum refining facilities.

e/ Refined products.

f/ May to November only.

g/ Estimated value of land, buildings and equipment.

# CHAPTER X

## CHEMICAL, FOOD AND ALLIED INDUSTRIES

### A. HISTORY

Manchuria possesses large natural resources suitable as raw materials for a chemical industry. However, no industrial installations of consequence existed prior to 1932 and few had been established prior to 1936. Beginning about 1936 and continuing during the war, a relatively large number of chemical factories were put into operation or were under construction to make Manchuria self-sufficient for many chemical products and to provide an excess capacity for supplying Japanese needs. Finished products usually could be shipped to Japan more cheaply than the raw materials and required considerably less cargo space. In general, production reached that required for domestic needs, but the goal of excess production to supply Japanese needs was never reached.

### B. GEOGRAPHICAL DISTRIBUTION

The chemical industry is located in southeastern Manchuria near sources of raw materials, power, and labor and adjacent to adequate transportation facilities. By far, the greatest number of plants are in or near the cities of Dairen, Mukden, Fushun, Changchun, Kirin, Harbin, and in the iron and steel industrial area near Anshan. The accompanying map shows the location of the major chemical plants.

### C. SOURCES OF INFORMATION

Although some information was obtained on almost 1200 chemical and food processing installations in Manchuria, nearly 1100 of these were very small, individual or family enterprises, such as grist mills and soya bean oil presses, which cannot be evaluated because of lack of adequate information. Evaluations in this report are based on 80 commercial plants upon which sufficient information was obtained. Of these plants 49 are located in Chinese-Nationalist-held territory and 31 in Communist-held territory. Actual plant inspections were made of 26 of these industrial installations representative of practically all phases of the industry. Detailed reports on the plants inspected are included in Appendix 10.

Information regarding plants was obtained from Economic and Scientific Section of SCAP in Tokyo, Japanese sources in Tokyo through Economic and Scientific Section and Natural Resources Section of SCAP, Northeast Chinese Economic Commission in Manchuria, Japanese former company and plant staff members in Manchuria, and from present plant managers and personnel, most of whom were Chinese. However, some of these individuals were Japanese; and in the Chinese Communist-held territory, they were Russian (Soviet). Much information in the form of plant layout diagrams, flowsheets, production data and operating procedures on individual plants and industries was obtained from these sources and is filed in our Source Files under the same numbers as the related Plant Inspection Reports which appear in Appendix 10. Members of the Mission were usually accompanied by staff officials or plant managers from the Northeast Chinese Economic Commission who assisted materially in the acquisition of information on each plant.

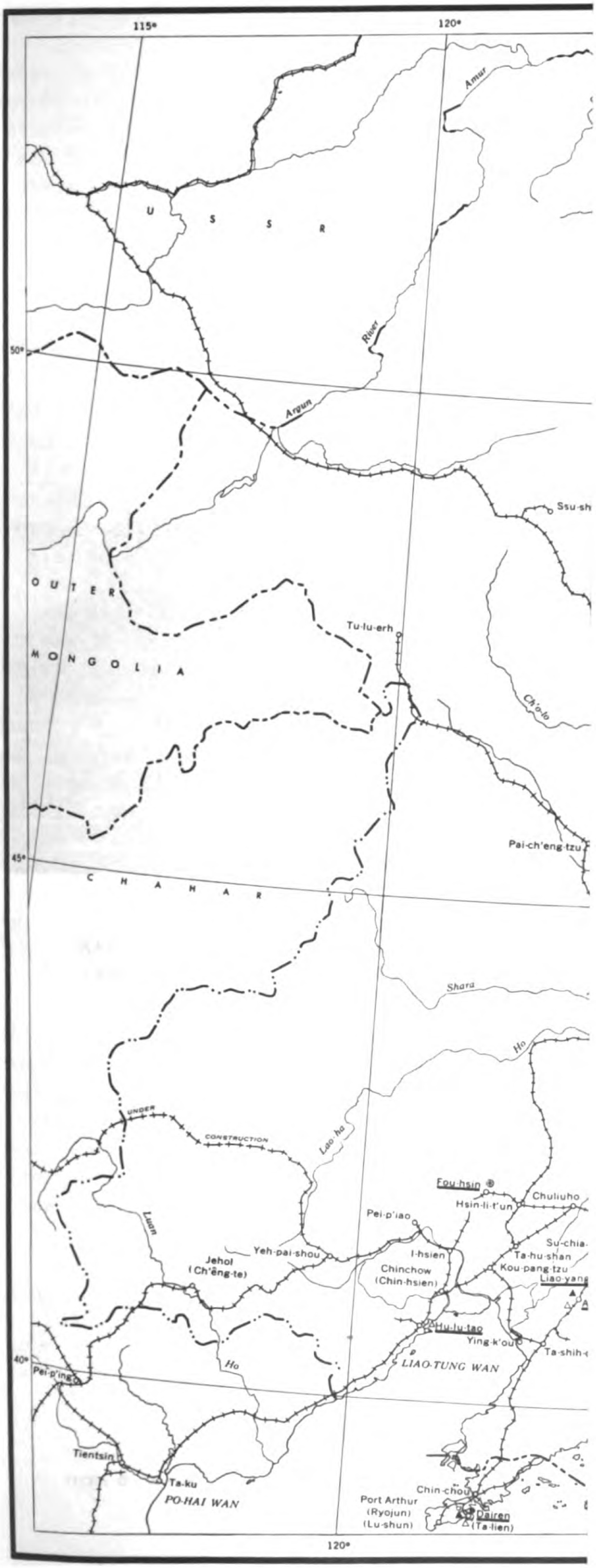
## D. DISCUSSION OF CHEMICAL INDUSTRY

### 1. Acid and Alkali Plants

The plants shown in Table C-2 (at the end of this chapter) had a total capacity of 16,500 tons per year for the manufacture of caustic soda. This capacity was reduced about 18 percent by Soviet removals and destruction. The hydrochloric acid capacity of 5,750 tons per year was reduced by 35 percent through removals. Ammonium sulfate was produced by three plants with a total annual capacity of 319,000 tons. In two of the plants the reduction in capacity is not known. Four plants produced sulfuric acid and had a capacity of 351,000 tons a year, of which 220,000 tons was 50 percent acid. This capacity was reduced by about 10 percent by removals. Nitric acid was produced at only one plant with a capacity of 33,000 tons 50 percent and 4,500 tons 90 percent acid per year. This plant is in Communist-held territory where permission to visit was not granted; consequently, the condition of the plants is unknown. Capacities for producing ammonium nitrate and bleaching powder were 15,500 and 3,500 tons per year respectively and little reduction in capacities was sustained by these plants. Soda ash was produced only at a Dairen plant, but regarding which no reports of removals have been made by the Chinese or Japanese. Its capacity was 60,000 tons per year. Table C-2 also furnishes the name, location, production and removal data on the plants of this type for which information was available.

The chemical industry in Manchuria was controlled largely by the Manchurian Industrial Development Company (MANGYO) through its various subsidiaries. Manchu Soda is owned largely by Mitsubishi Chemical Industry Company of Japan. Stock in the Manchu Iron Company, Ltd. was reportedly owned by Mangyo (50 million yen), SMR (45 million yen), and government (40 million yen). The Manchu Chemical Industry Company at Dairen was reported to be owned by SMR, Central Union Cooperative and the public.

Raw materials for the acid and alkali plants were obtained largely from Manchuria with the exception of iron pyrite which was obtained from China and Japan. The products were also largely utilized in Manchuria, practically none being exported.


115°
120°
Amur
U S S R
River
50°
Argun
Ssu-sh
O U T E R
M O N G O L I A
Tu-lu-erh
Ch'o-lo
Pai-ch'eng-tzu
45°
C H A H A R
Shara
Ho
Lao ha
UNDER
CONSTRUCTION
Luan
Fou-hsin
Hsin-li-t'un
Chuliuho
Pei-p'iao
Su-chia
I-hsien
Ta-hu-shan
Yeh-pai-shou
Jehol
(Ch'êng-te)
Chinchow
(Chin-hsien)
Kou-pang-tzu
Liao-yang
Hu-lu-tao
Ying-k'ou
Ta-shih-
Ho
LIAO-TUNG WAN
40°
Pei-p'ing
Tientsin
Ta-ku
PO-HAI WAN
Port Arthur
(Ryojun)
(Lu-shun)
Chin-chou
Dairen
(Ta-lien)
120°

these individuals were Japanese; and in the Chinese Communist-held territory, they were Russian (Soviet). Much information in the form of plant layout diagrams, flowsheets, production data and operating procedures on individual plants and industries was obtained from these sources and is filed in our Source Files under the same numbers as the related Plant Inspection Reports which appear in Appendix 10. Members of the Mission were usually accompanied by staff officials or plant managers from the Northeast Chinese Economic Commission who assisted materially in the acquisition of information on each plant.

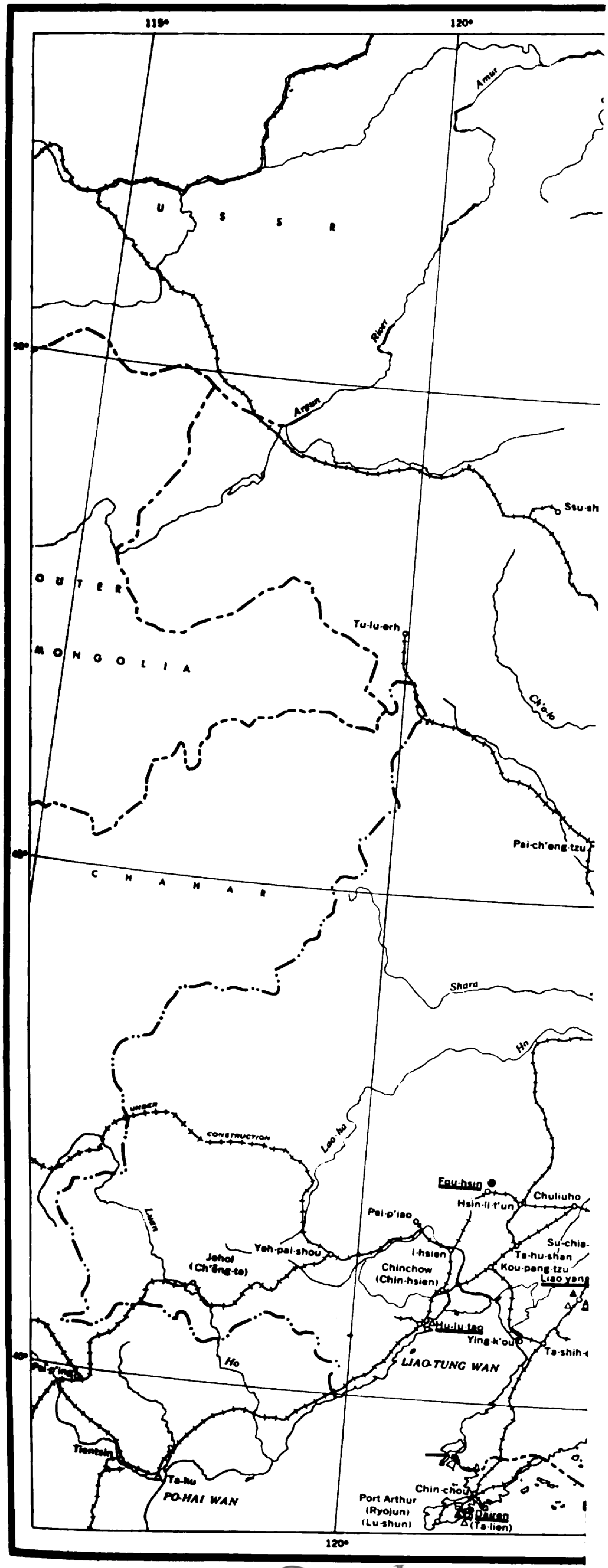
## D. DISCUSSION OF CHEMICAL INDUSTRY

### 1. Acid and Alkali Plants

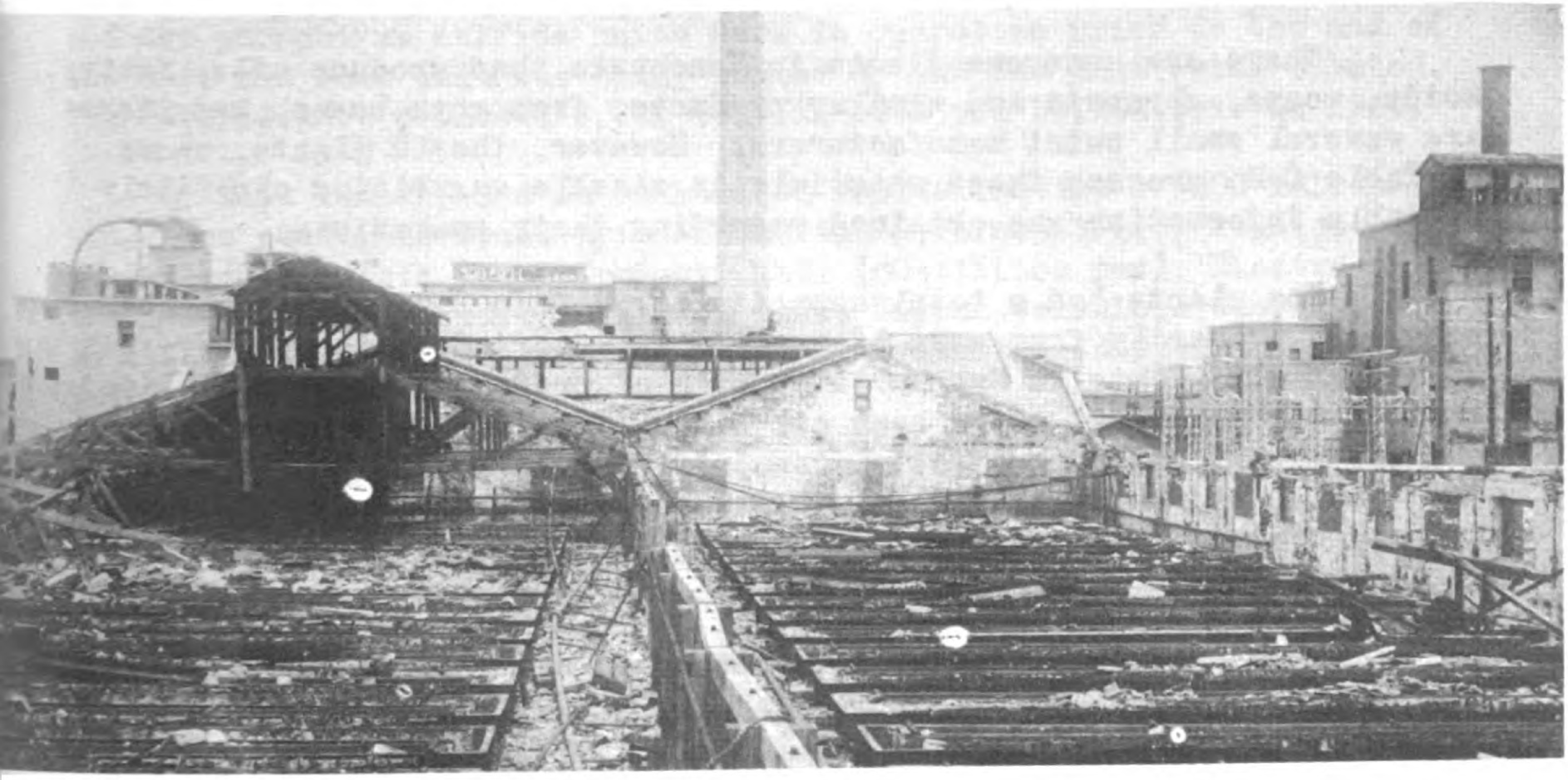
The plants shown in Table C-2 (at the end of this chapter) had a total capacity of 16,500 tons per year for the manufacture of caustic soda. This capacity was reduced about 18 percent by Soviet removals and destruction. The hydrochloric acid capacity of 5,750 tons per year was reduced by 35 percent through removals. Ammonium sulfate was produced by three plants with a total annual capacity of 319,000 tons. In two of the plants the reduction in capacity is not known. Four plants produced sulfuric acid and had a capacity of 351,000 tons a year, of which 220,000 tons was 50 percent acid. This capacity was reduced by about 10 percent by removals. Nitric acid was produced at only one plant with a capacity of 33,000 tons 50 percent and 4,500 tons 90 percent acid per year. This plant is in Communist-held territory where permission to visit was not granted; consequently, the condition of the plants is unknown. Capacities for producing ammonium nitrate and bleaching powder were 15,500 and 3,500 tons per year respectively and little reduction in capacities was sustained by these plants. Soda ash was produced only at a Dairen plant, but regarding which no reports of removals have been made by the Chinese or Japanese. Its capacity was 60,000 tons per year. Table C-2 also furnishes the name, location, production and removal data on the plants of this type for which information was available.

The chemical industry in Manchuria was controlled largely by the Manchurian Industrial Development Company (MANGYO) through its various subsidiaries. Manchu Soda is owned largely by Mitsubishi Chemical Industry Company of Japan. Stock in the Manchu Iron Company, Ltd. was reportedly owned by Mangyo (50 million yen), SMR (45 million yen), and government (40 million yen). The Manchu Chemical Industry Company at Dairen was reported to be owned by SMR, Central Union Cooperative and the public.

Raw materials for the acid and alkali plants were obtained largely from Manchuria with the exception of iron pyrite which was obtained from China and Japan. The products were also largely utilized in Manchuria, practically none being exported.


115°
120°
Amur
U S S R
River
Argun
50°
Ssu-sh
OUTER
MONGOLIA
Tu-lu-erh
Ch'o-lo
Pai-ch'eng-tzu
45°
CHAHAR
Shara
Ho
UNDER
CONSTRUCTION
Lao-ha
Fou-hsin
Hsin-li-t'un
Chuliuho
Pei-p'iao
Luan
Yeh-pai-shou
I-hsien
Su-chia-
Ta-hu-shan
Jehol
(Ch'êng-te)
Chinchow
(Chin-hsien)
Kou-pang-tzu
Liao-yang
Hu-lu-tao
Ying-k'ou
Ta-shih-
40°
Ho
LIAO-TUNG WAN
Pei-p'ing
Tientsin
Ta-ku
PO-HAI WAN
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
120°

717231 O - 1946 - [illegible]



MANCHU SODA MANUFACTURING COMPANY, KAIYUAN - View showing destruction of the electrolytic cells and building.

With the exception of the Kaiyuan caustic soda plant and the Anshan plant (see Plant Inspection Reports 20-C-1 in Appendix 10 and 2-A-1 in Appendix 5), the capacities of the acid and alkali plants have not been greatly reduced and can be restored to near their previous capacities. The need for these chemicals is great and the plants should be restored as soon as the needed equipment and supplies can be obtained. The Kaiyuan electrolytic soda plant was completely removed or destroyed requiring entire reconstruction for restoration and the restoration of the Anshan plant, part of the Iron Works, will depend upon the replacement of the iron and steel facilities.

## 2. Oils, Fats and Paints

There are numerous plants in Manchuria that produce oils, fatty acids, soaps, glycerin and similar products, from soya beans, and there are several small paint manufacturers. However, the 12 plants, shown in Table C-3, process these materials in sizable quantities and fairly reliable information was obtained regarding their operations.

The plants had a total capacity to produce 322,000 tons of oil per year, primarily from soya beans. It is reported that there are 642 soya bean oil plants in Manchuria capable of producing about 3 million tons of oil per year. Soya bean oil was used primarily for cooking and salad oils but much of it was saponified into soaps and hardened for candles and many other uses. Small quantities were used for soya sauces, synthesized into lubricating oils, hydrolyzed to produce glycerin and extracted for fatty acids.

Soap production capacity was reported as 6,150 tons. Soya oil was the primary base for soap; however, considerable coconut oil was imported, especially for preparing toilet soaps.

The oil and fat plants had been damaged very little by the Soviets or local populace and by minor restoration and repair most of the plants could be put into operable condition.

Practically all of the stocks of soaps and oils were removed by either the Soviets or populace. Detailed removals from those plants upon which information was available are given in the individual Plant Inspection Reports in Appendix 10 and in the Chemical Industry Removal Report, Source File 202-C-1.

## 3. Electro-Thermal Plant (Manchu Electrochemical Company, Ltd.)

An integrated electro-thermal manufacturing plant for making calcium carbide and chemicals from it was being established at Kirin near the source of hydroelectric power. Most of this plant was still under construction at the end of the war and the plant was largely removed or destroyed by the Soviets. It produced coke and byproducts from coal, calcium carbide in a 15,000 T/yr capacity plant, and was installing a unit to produce 66,000 T/yr additional carbide.

There was also in process of erection a calcium cyanamid plant, to have a capacity of 30,000 T/yr and a synthetic butanol plant to produce 4,000 T/yr. Finally, a process for producing red phosphorus was being installed to have a capacity of 50 T/yr and one to produce phosphorus sulfide was installed and operating with a capacity of 80 T/yr. The coke unit had a capacity of 300,000 tons of coke per year. The actual expenditure as reported by the Japanese (See Source File 9-C-1) had been $23,500,000, excluding the cost of the coke plant but including all the correlated general purpose units of the whole integrated combine. Likewise excluded from this figure is the cost of the synthetic rubber plant which was built there also. This is handled separately under "Synthetic Rubber". The minor carbide and the phosphorus sulfide units were in operation prior to the end of the war; one coke unit was being heated up and one unit being erected. The carbide unit produced 8,981 tons in 1943 and 10,153 tons in 1944.

This company had an authorized capitalization of 200 million yen. The stock was owned by: Manchurian Government (137 million yen); Manchurian Electric Power Company, Ltd. (60 million yen); Electrochemical Industry, Ltd. (1 million yen); Nippon Celluloid Company, Ltd. (1 million yen); and Mitsubishi Chemical Synthetic Industry (1 million yen).

The value of removals of equipment from these plants is estimated at $3,100,000, and the value of materials and supplies as $350,000. This is exclusive of equipment removals in the synthetic rubber plant, and inclusive of damage done to plant welfare buildings. The productive capacity was reduced practically 100 percent by these removals.

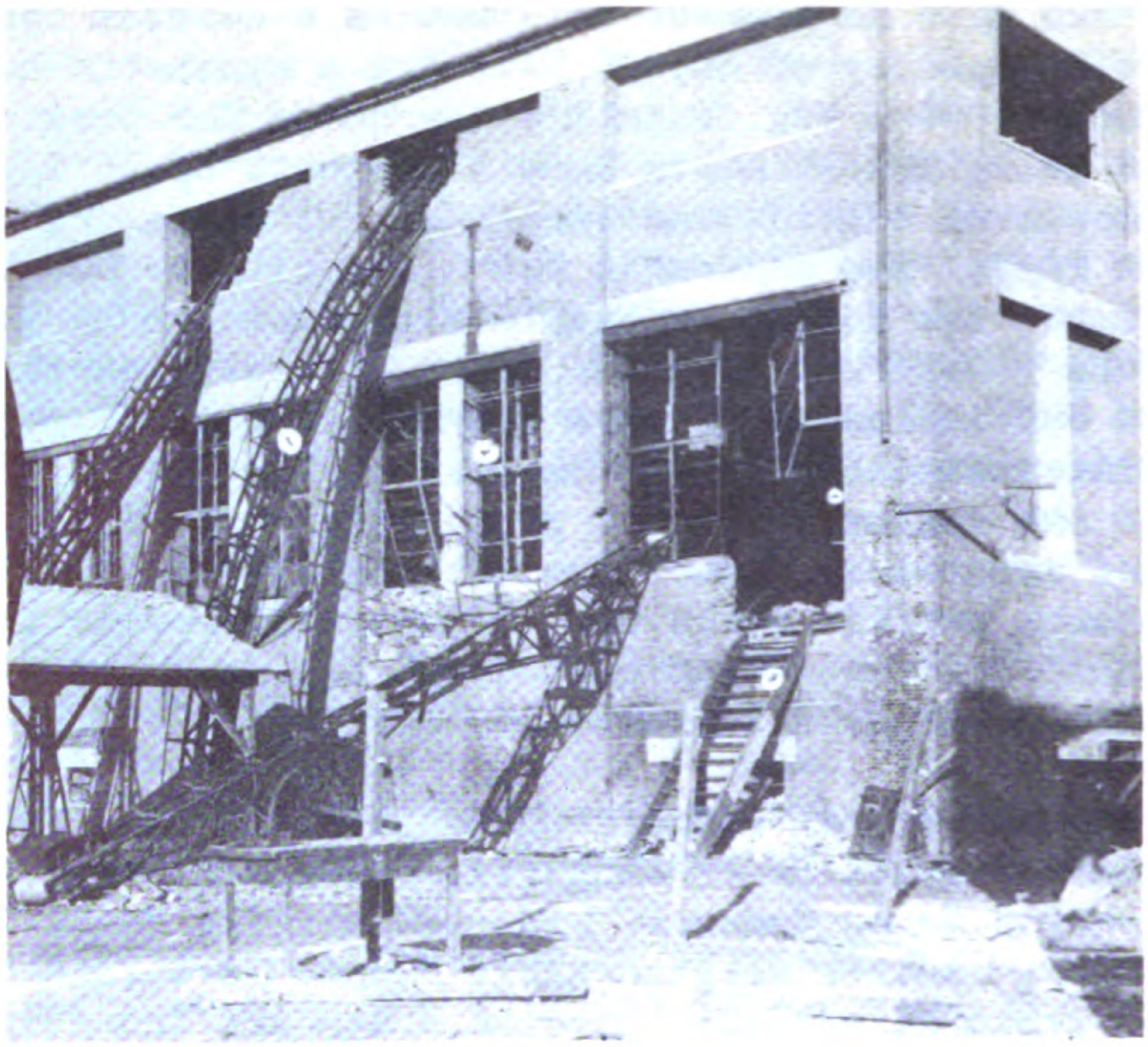
A detailed report of the removals, plant processes and other pertinent data is given in Plant Inspection Report 9-C-1 in Appendix 10, and in Source File 9-C-1.

### 4. Natural Rubber Products Industry

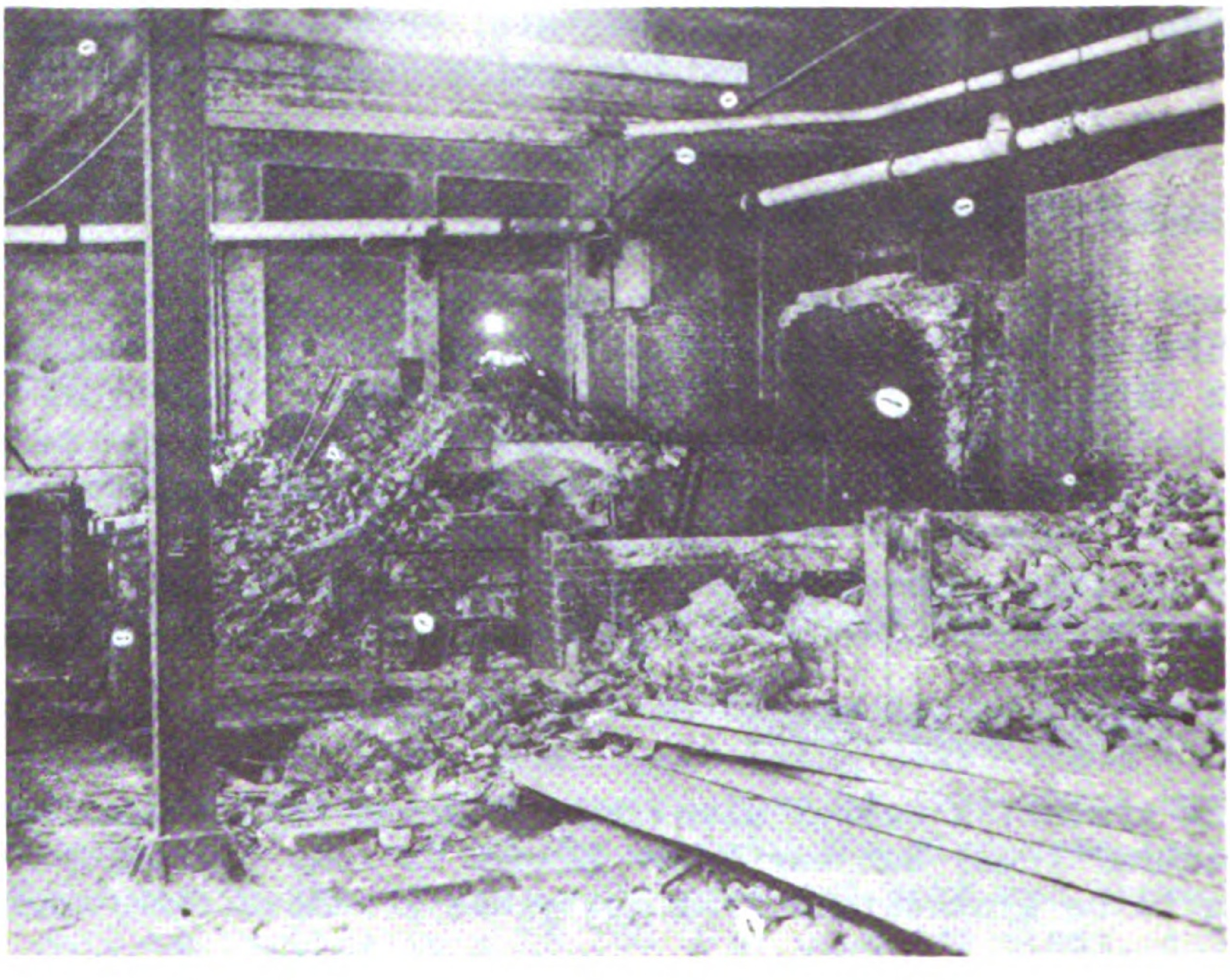
Four plants are included in this group, making truck, auto and bicycle tires and belting, shoes and raincoats. Removals were quite serious in this industry, almost all the equipment being removed from three of the four plants, and half of the equipment in the fourth. At the Liaoyang plant of the Manchu Rubber Company the building was burned down after the removal of the equipment by the Soviet forces. Table C-4 at the end of this chapter gives the data on removals and their valuation for these plants.

### 5. Synthetic Rubber Plant

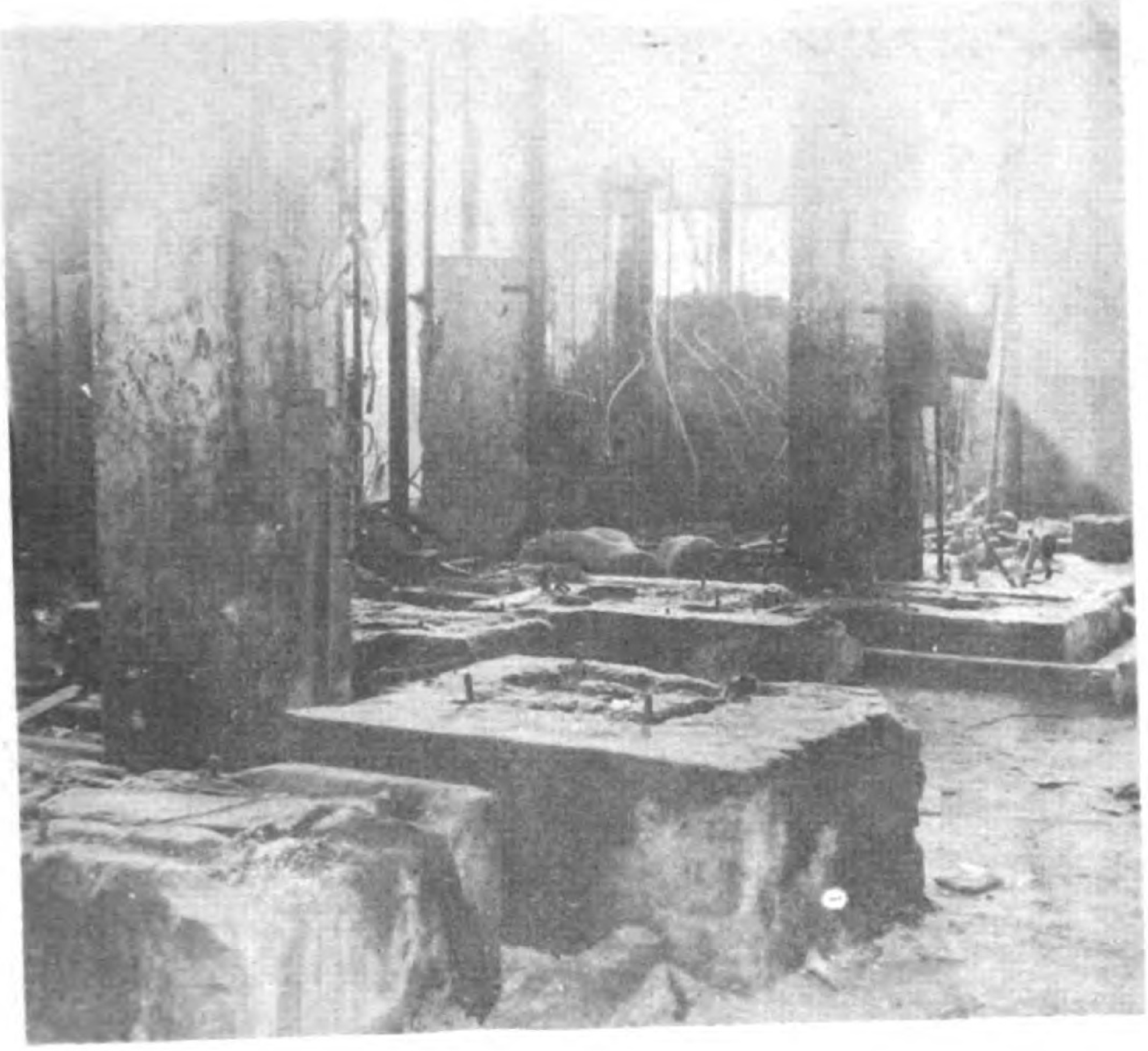
The synthetic rubber plant at Kirin was in the testing stage since September 1944, but was never placed in full operation. Neoprene rubber was to be synthesized from acetylene produced from calcium carbide



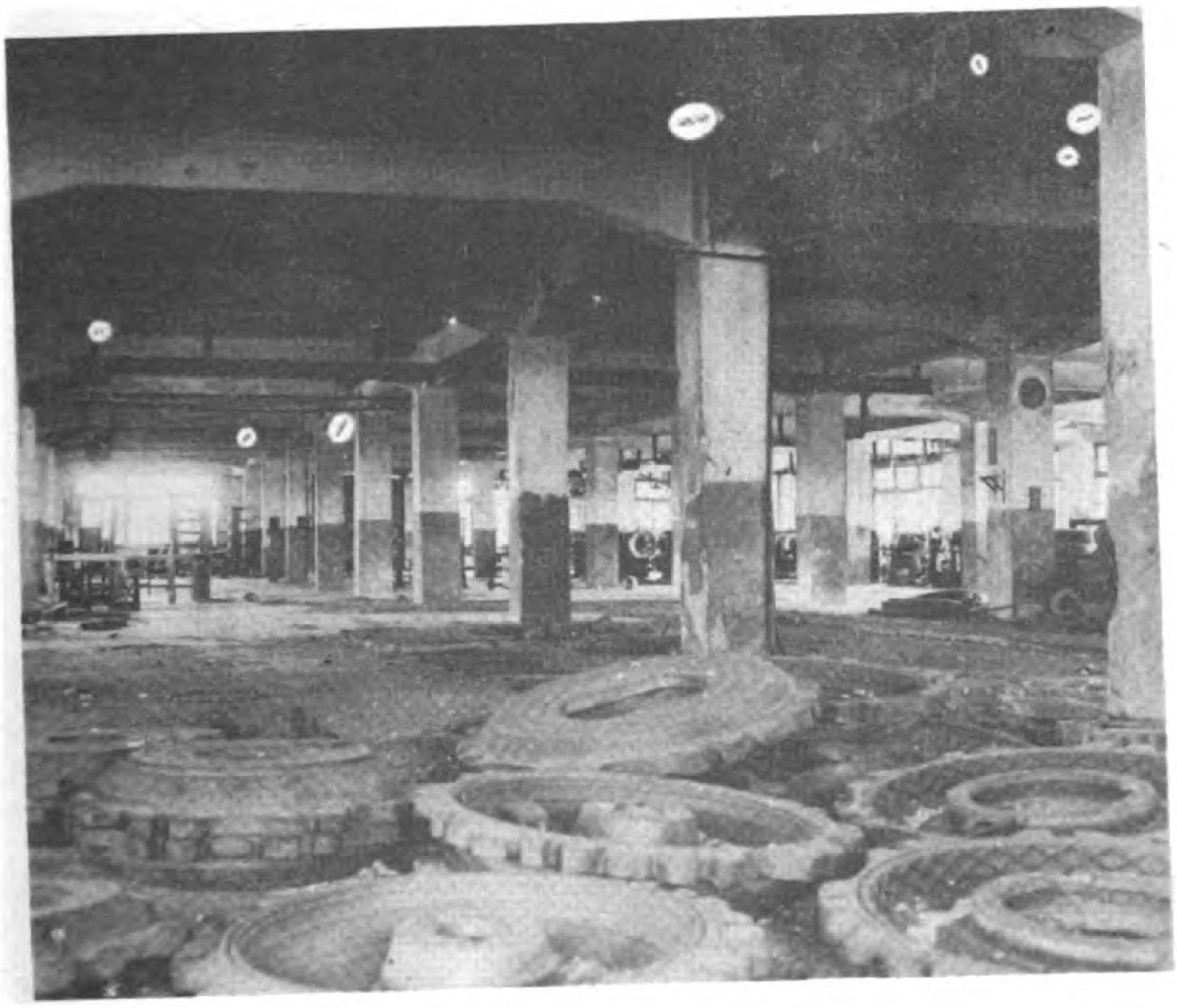
MANCHU RUBBER COMPANY, LIAOYANG - Exterior of boiler house showing opening made in wall for removal of boiler.



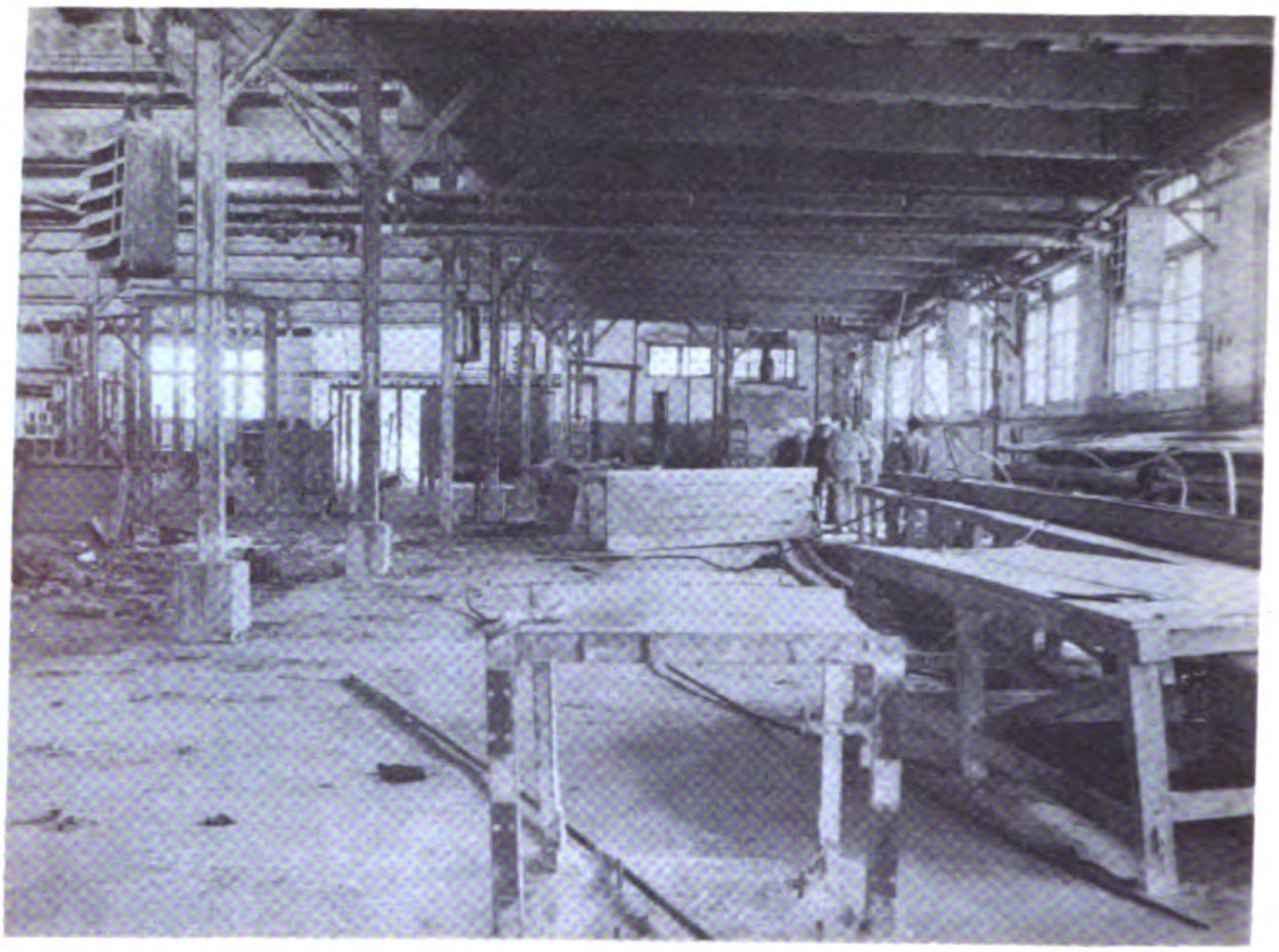
MANCHU RUBBER COMPANY, LIAOYANG - Interior of boiler house after boilers were taken away.



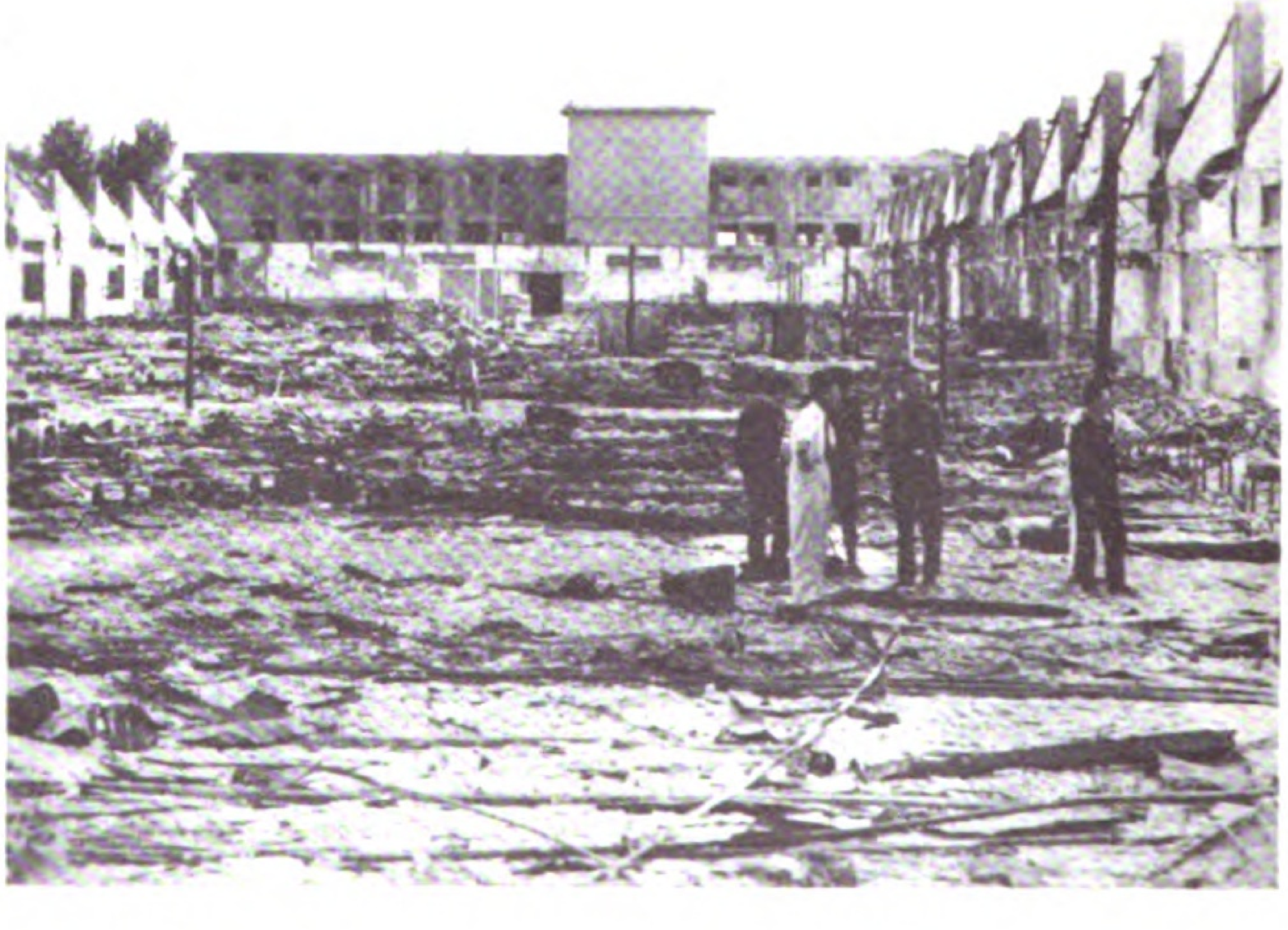
MANCHU RUBBER COMPANY, LIAOYANG - Ground floor of tire manufacturing building where heavy rubber processing equipment was removed during Soviet occupancy.



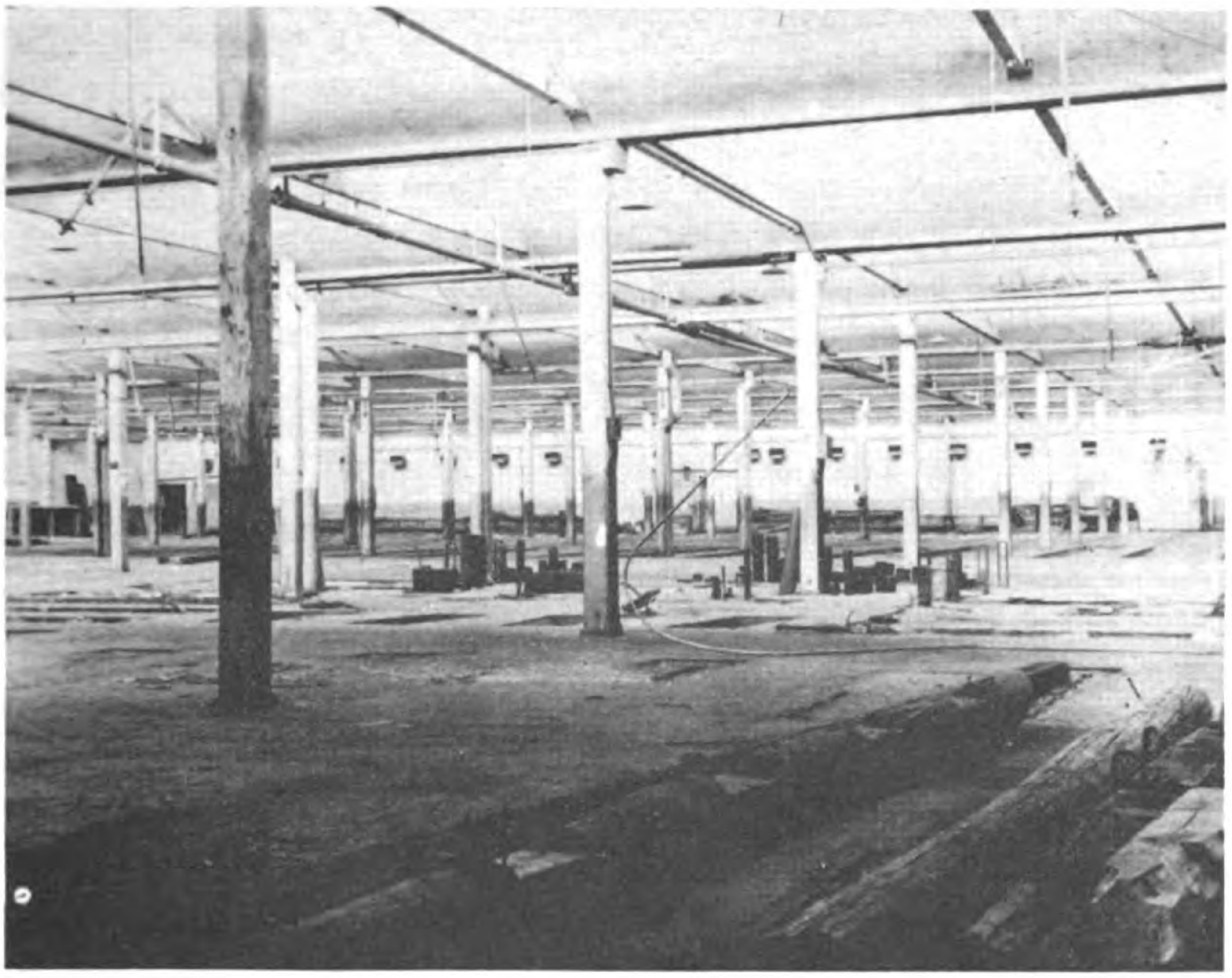
MANCHU RUBBER COMPANY, LIAOYANG - Second floor of tire manufacturing building from which all modern equipment for making auto and truck tires was removed.



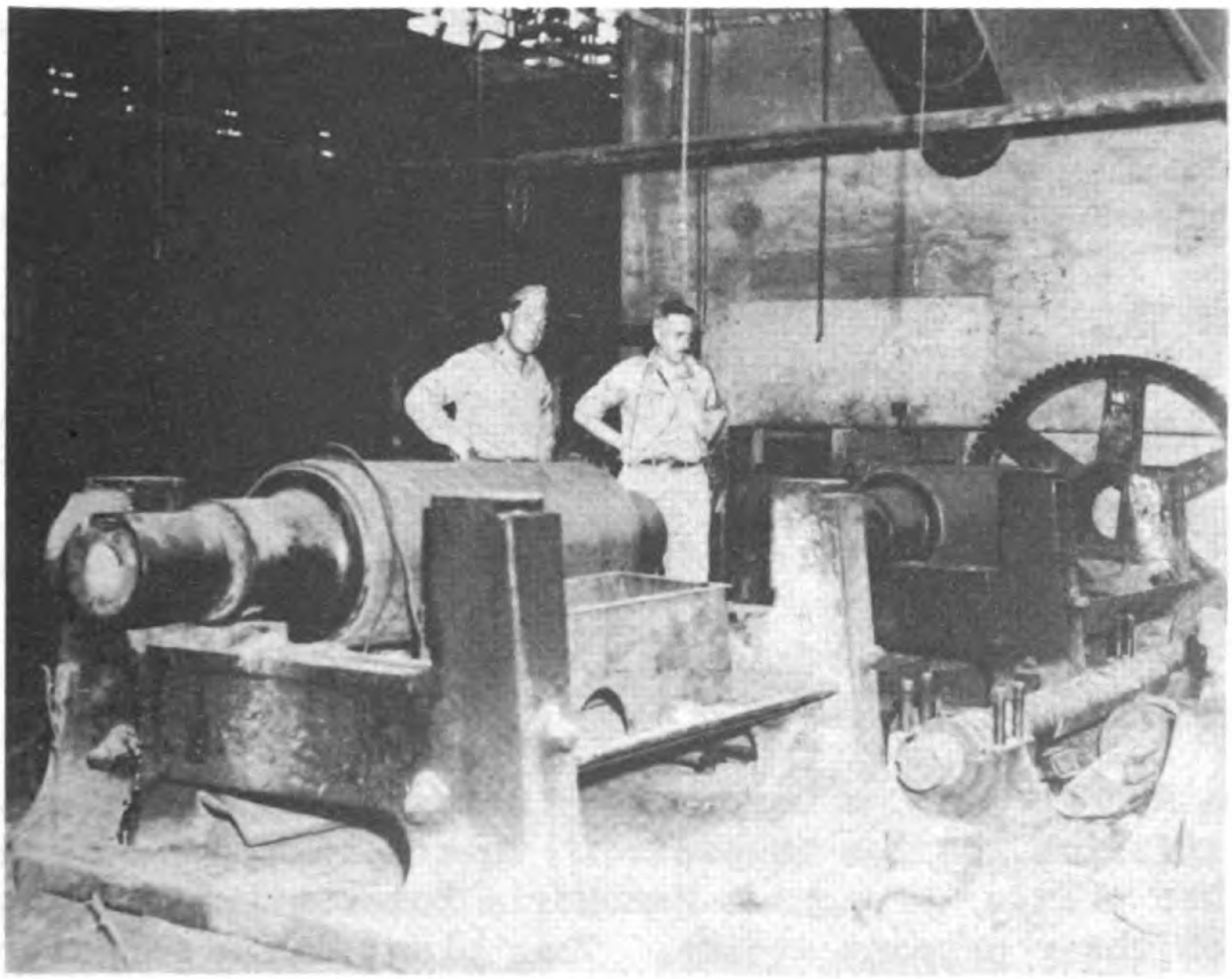
MANCHU RUBBER COMPANY, LIAOYANG - Interior of belt making building from which all manufacturing equipment was removed. Note modern method of heating building with overhead blower radiators.



MANCHU RUBBER COMPANY, LIAOYANG - Remains of building used for making shoes and raincoats. Equipment was removed and building was burned during Soviet occupancy. Two-story building in the background of picture had the same treatment but brick and concrete construction resisted fire destruction.



TOYO RUBBER TIRE COMPANY, MUKDEN - Tire Cord Plant building from which all cotton spinning equipment had been removed.



TOYO RUBBER TIRE COMPANY, MUKDEN - Two rubber mixing rolls, partially dismounted from which parts had been removed during Soviet occupancy. This was the only movable equipment remaining in the entire plant.

made by the Manchurian Electro-Chemical Company at Kirin. A description of the process, plant equipment and removals is given in the plant report in the appendix to this summary report and in Source File 9-C-2.

The plant had a capacity of 750 tons yearly and a total value of $3,850,000, which includes the buildings, machinery, tools, instruments and supplies. Removals are established to total $1,230,000. Damage to buildings as a result of removals is estimated at $50,000.

6. Explosives

Seven plants for making explosives, fuses and detonators are listed in Table C-5 at the end of this chapter, together with their capacities and the effect of Soviet removals.

The Manchurian Explosives Company plants were constructed during the period 1935 to 1944. These plants utilized ammonium nitrate, nitronaphthalene and salt for the manufacture of this type of explosive together with cotton yarn hemp, yarn, sulfur, potassium nitrate and copper for fuses and caps. Practically all of these materials were produced in Manchuria. The explosives were used largely for mining and construction work and for military purposes. The company was capitalized for 20,000,000 yen and was owned by the Manchurian Government, Mukden Arms Factory and the Japanese Life Insurance Corporation.

The Mukden Arsenal was estimated to cost $5,000,000 to construct and was owned by the Japanese Army. It was never put into full scale operation. It was completely destroyed by explosions in each building after some equipment removals had been made reportedly by the Soviet Army. The smokeless powder unit was completely destroyed.

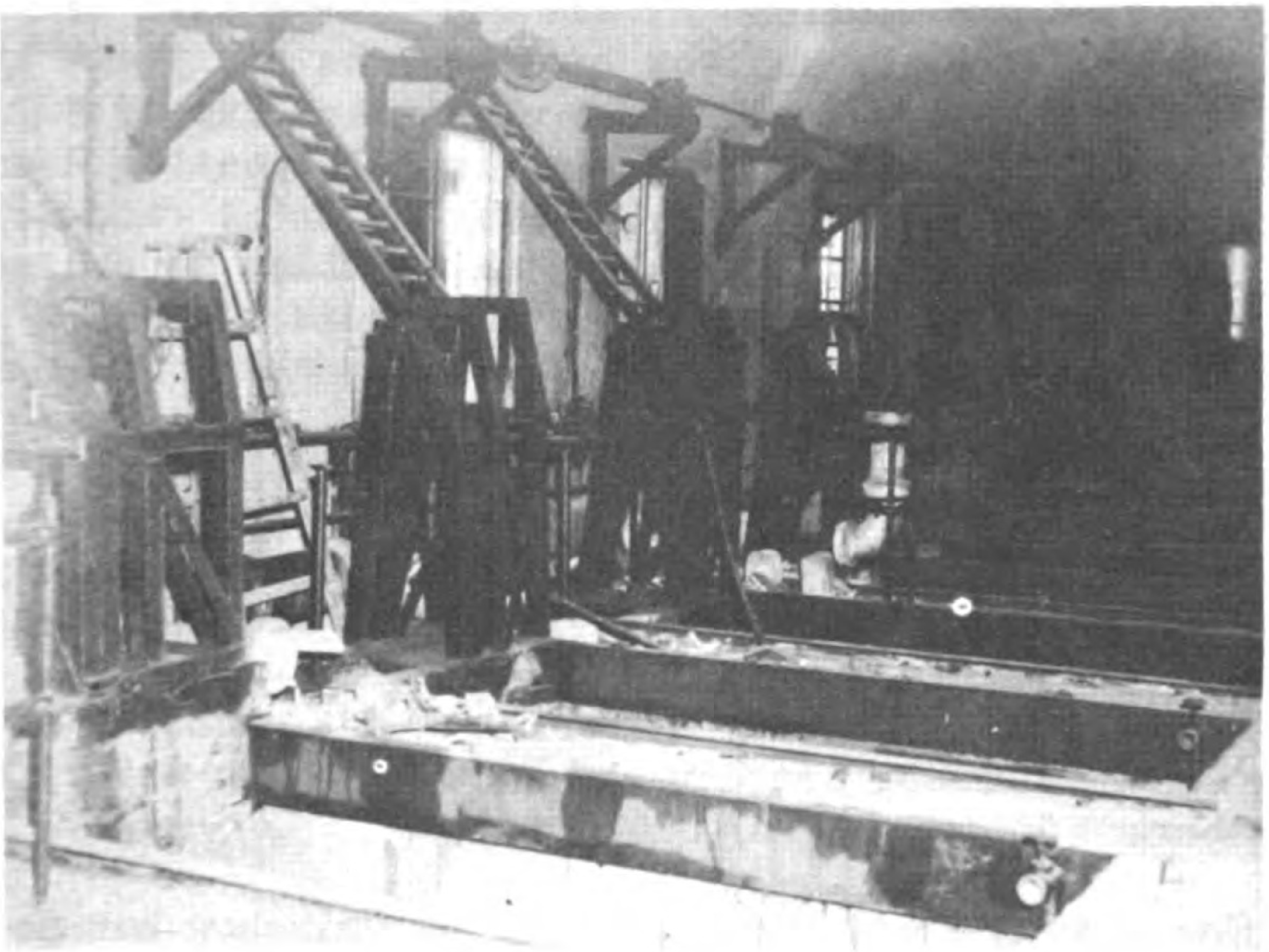
Further information on the Liaoyang plant and the Mukden Arsenal may be found in Plant Inspection Reports 2-C-3 and 1-C-2 in Appendix 10.

7. Oxygen

The Hoten Oxygen Works at Anshan was inspected and had a capacity of 120,000 cylinders a year of oxygen produced by liquefaction of air and subsequent fractionation to remove nitrogen by the Linde process. The plant is intact. Further information is given in Plant Inspection Report 2-C-1 in Appendix 10.

8. Manufactured Gas

The Manchurian Gas Company's plant at Changchun for the production of artificial gas was inspected. This company owned and operated several other plants throughout Manchuria but little information was available on their present status. This plant had a capacity of 582 million cubic feet of gas, 29,200 tons of coke and 1,460 tons per year.



ARSENAL #383, LIAOYANG - Empty foundations of four nitrators for picric acid. Nitrators in an older unit were not removed which would probably indicate that the Soviets were selecting only the best equipment from this plant.

ARSENAL #383, LIAOYANG - Former location of four centrifuges removed from pictric acid plant.

It was capitalized at 9.5 million yen and was constructed in 1935. About 20 percent of the equipment was removed from the plant by the Soviets and local populace, reducing the plant capacity by 60 percent. Further details on the plant are given in Plant Inspection Report 8-C-2 in Appendix 10 and Source File 8-C-2. The total value of equipment removed by the Soviets and by the local populace is estimated as $223,000, of which half or $111,500 is estimated as the value of the items removed by Soviet forces.

### 9. Leather Industry

Little information was obtained on the leather industry in Manchuria. The following plants and their status are reported:

(a) Manchu Kikaku Company at Mukden had a capacity of 1300 tons of sole and harness leather and 12,000 square meters of upper leather.

(b) The same company had a factory at Chinchow but no information on its present status was obtained.

(c) Sogosei Company, Ltd., at Harbin had a sole and harness leather capacity of 400 tons a year.

No equipment removals of consequence were reported for any of these factories. About 300 tons of material and supplies of an estimated value of $200,000 were removed from the Manchu Hukaku plant at Mukden.

### 10. Alcohol Industry

In addition to the eight plants shown below, it is reported that there are numerous small distilleries producing alcohol from domestic wines.

The ethyl alcohol plants were left largely intact by the Soviets except for the removal of automobiles, some grain and finished alcohol. The Manchu Fermentation Works at Mukden and the Chinese Changchun Railway and Daido Alcohol plants are operating at present. Further details regarding these plants will be found in the Plant Inspection Reports in Appendix 10.

The Chinese Changchun Railway plant is being operated by the Soviet officials who are in charge of the railroad operations in Harbin. The Daido Alcohol Company is reported to be operated by the Tschurin Company in Harbin. The Mukden plant is operated by the Northeast Chinese Economic Commission. Further data will be found in Source File 303-MR-3-2.

## ETHYL ALCOHOL PLANTS

| Plant | Capacity Gal/Yr | Production (Gallons) 1943 | 1945 |
|---|---|---|---|
| Manchu Fermentation Works<br>Mukden | 1,200,000 | | |
| Chinese Changchun Railroad<br>Harbin | 950,000 | | 2,000,000 |
| Daido Alcohol Company<br>Harbin | 2,960,000 | 2,815,000 | |
| Asha Alcohol Company<br>Harbin | 1,155,000 | 800,000 | |
| Hokuman Sugar Company<br>Acheng | 620,000 | 580,000 | |
| Staple Products Ind. Co.<br>Mukden | 760,000 | 583,000 | |
| Kwantung Chou Industry<br>Dairen | 171,000 | 145,000 | |
| Chen-Pien Alcohol Company<br>Heiho | 832,000 | 648,000 | |
| Total | 8,648,000 | | |

11. Glass Manufacturing

Information was obtained on three factories, two in Mukden and one in Dairen. The Manchu Shoko Glass Company at Mukden had a capacity of 480,000 cases of window glass and its production in 1944 was 456,000 cases. While only five percent of the equipment was removed by the Soviet forces, the reduction in capacity was 100 percent as shown in Plant Inspection Report 1-C-4 in Appendix 10 and in Source File 201-ZW-1. The value of the equipment removed is estimated as $15,600 and of the materials and supplies taken as $250,000. The Manchu Optical Company at Mukden which had a capacity of 11,900 pieces of optical glass had 90 percent of its equipment removed with a consequent 100 percent reduction in capacity. Estimated value of the equipment removed is $500,000 and of supplies and materials removed from this plant, $200,000. The branch plant of the Shoko Glass Company at Dairen had a capacity of 500,000 cases of window glass and was reported to be intact in February 1946. No damage is assessed to this plant.

Total estimated value of removals in the glass industry is $965,600. Source File 202-C-1 gives further details on this industry.

### 12. Miscellaneous Chemical Plants

Included under this category are the three graphite products companies and the Match Manufacturing Company at Kirin. Production capacity and other information on these plants is shown in Table C-6 at the end of this chapter.

### 13. Flour Mills

Eleven flour mills, their capacities and removal information are shown in this section. There are reported to be 471 additional mills or installations grinding grains, with a total annual capacity of 242,000 tons, valued at two million yen. No information was obtained on the present status of these plants.

The Kangteh Flour Mill at Ssupingchieh was inspected and was found intact. Further details regarding the plant will be found in the Plant Inspection Report 19-J-1 in Appendix 10. Much of the stock of flour was removed from this plant reportedly by the Communists, who traded it to the Soviets for Japanese arms. (See supplement to Plant Inspection Report 19-E-1 in Appendix 9, on the Japanese First Army Fuel Depot at Ssupingchieh for discussion of events during Soviet occupation.) Undoubtedly much of the stocks from these flour mills was taken during Soviet occupation, but no definite information was available. No reports of equipment removals from any of the mills were obtained.

FLOUR MILLS

| Name | Location | Capacity Tons/Yr | Equipment Removals |
|---|---|---|---|
| Kangteh Flour Mill | Ssupingchieh | 25,000 | 0 |
| East Asia Flour Mill | " | ? | 0 |
| Nichiman Flour Mill | Harbin | 27,400 | * |
| Trenhsinfu Flour Mill | " | 17,140 | * |
| Shuanghosheng Fl. Mill | " | 25,000 | * |
| Kangteh Flour Mill | Tiehling | 13,800 | * |
| Kangteh Flour Mill | Changchun | 7,430 | * |
| Nitto Flour Mill | " | 22,000 | * |
| I-Faho Flour Mill | " | 20,900 | * |
| Fushunhou Flour Mill | " | 16,000 | * |
| Oriental Flour Mill | " | 7,800 | |
| Total | | 182,470 | |

* None reported from Chinese or Japanese sources.
An estimate of $1,290,000 has been made for total flour removals.

14. Sugar Refineries

Information was obtained on four factories which extract and refine sugar from beets. One of these refineries (Mukden) was inspected; however, it had been converted to an alcohol plant and much of the sugar refining equipment had been shipped to Changchun prior to the end of the war. Of the remaining three refineries, the Changchun plant was destroyed by fire, the Harbin plant was reported to have been largely destroyed by the local populace and the condition of the third, at Acheng, is unknown. It was rumored that the Acheng plant equipment was removed by Soviet troops, but no verification of this rumor could be obtained. Table C-7 at the end of this chapter gives the capacities, production and present status of these plants.

These sugar refineries were operated under government subsidy in order to compete with imported sugar from the southern Pacific areas. Former Japanese officials state that it will be necessary to continue this subsidy policy to maintain the industry on a paying basis.

Raising of sugar beets was encouraged by the Japanese in Central Manchuria because of the suitability of the climate and soil to this type of crop, the high weight yield per unit area and soil improvement. Maintaining self-sufficiency in the production of sugar would seem a desirable condition if production costs are not greatly out of line with the cost of imported sugar. Study should be given to both the growing of the beets and refining practice to improve the overall economy of the industry. (See Source File 303-NR2-1).

15. Brewing Industry

Six plants are reported to be making beer in Manchuria. These plants have a total capacity of 10 million gallons of beer annually, produced 9.5 million gallons in 1944, and apparently all are operating at present, since no reports of removals or damage were obtained.

Two breweries in Mukden, the Manchurian Beer Company and the Asia Beer Company, have a capacity of 7,850,000 gallons per year. The Harbin Beer Company has plants in Harbin and Mutanchiang, the latter being in the process of construction. Harbin also has the Oriental Beer Company breweries. The Harbin companies have a total capacity of 1,650,000 gallons per year. The capacities of the individual plants were not reported. The actual demand for beer is said to exceed the capacity of the present plants.

The Harbin Beer Company maintains a malt plant in Harbin producing malt from barley. Twenty hectares of land was put into the raising of hops in 1932, but the quality was said to be poor. (See Source File 303-NR3-1.)

### 16. Tobacco Industry

Manchuria produces approximately 30,000 tons of tobacco annually, which is reported to be sufficient for local demand. However, the quality is inferior to Chinese or American tobaccos, so in all probability Manchuria will never be able to export tobacco products.

Table C-8 at the end of this chapter, gives a list of the cigarette manufacturing plants in Manchuria, their capacities and present status.

## E. ESTIMATE OF DAMAGE

Table C-1 at the end of this chapter gives a Recapitulation of the Manchurian Chemical, Food and Allied Industries, and the total estimate of damage. Largely left intact are the oxygen, leather, alcohol, flour, sugar, and brewery plants. Heaviest damage was sustained by the rubber, oil, and electrothermal plants. The total losses to the industries due to removals and damages done by the Soviets, and removals of materials and supplies during the Soviet occupation is estimated to be $14,000,000. As previously pointed out no information is available regarding a good many of the industrial installations and it is quite possible that this figure is low.

## TABLE C-1

## RECAPITULATION OF CHEMICAL, FOOD, AND ALLIED INDUSTRIES

| Type of Plant | Number of Plants | Capitalization or Estimated Value | Estimated Value of Plant Losses Due to Removals by Soviet Forces | Estimated Value of Materials & Supplies Removed by Soviet Forces and/or Native Chinese* | Estimated Value of Equipment Removals or Destruction of Buildings by Native Chinese |
|---|---|---|---|---|---|
| Acids and Alkalies | 8 | $20,000,000 a/ | $ 350,000 e/ | $ | $ |
| Oils, Fats and Paints | 12 | 8,930,000 | 50,000 | 1,694,145 | |
| Electrothermal Industry | | 23,500,000 b/ | 3,100,000 | 350,000 | |
| Natural Rubber Products | 4 | 6,260,000 c/ | 1,230,000 | 2,541,000 | 200,000 |
| Synthetic Rubber | 1 | 2,380,000 b/ | 1,180,000 | 50,000 | |
| Explosives | 7 | 5,200,000 d/ | 721,700 | 150,000 | |
| Manufactured Gas | 1 | 2,230,000 d/ | 111,500 | - | 111,500 |
| Oxygen | 1 | 250,000 c/ | 0 | - | |
| Leather & Products | 3 | 2,100,000 | 0 | 200,000 | |
| Ethyl Alcohol | 8 | 12,400,000 | 0 | - | |
| Glass | 3 | 2,500,000 | 515,600 | 450,000 | |
| Misc. Chemicals | 4 | 5,500,000 | 225,000 | | |
| Flour Mills | 11 | 6,600,000 | 0 | f/ | |
| Sugar Factories | 4 | 3,730,000 | 0 | | 400,000 |
| Breweries | 6 | 2,460,000 | 0 | | |
| Tobacco | 5 | 24,400,000 | 1,200,000 | | |
| TOTAL | 78 | $128,440,000 | $8,683,800 | $5,435,145 | $711,500 |

---

* Figures on value of materials and supplies removed were obtained from Chinese and Japanese sources, but no verification of amounts and values was possible.

a/ Partly estimated capitalization. See Table C-2. Some of these plants are parts of larger combines.

b/ Cost, including that of buildings, was given by Japanese. See Source File 9-C-1.

c/ Estimated cost.

d/ Capitalization - Chinese information.

e/ See Table C-2.

f/ An uncertain estimate of $1,290,000 has been made for total flour removals.

## TABLE C-2

## ACID AND ALKALI PLANTS

|  |  |  |  | Production |  | ESTIMATED Removal Loss |  |  |
|---|---|---|---|---|---|---|---|---|
| Plant | Products | Capitalization | Capacity (Metric Tons/Yr.) | (Metric Tons) 1943 | 1944 | Equipment | Capacity | Value (U.S. $) |
| Manchu Chemical | Am. Sulfate ( |  | 240,000 | 53,788 |  |  |  |  |
| Industry Co., Ltd.; | Am. Nitrate ( |  | 13,500 | 10,812 |  |  |  |  |
| Dairen | Ammonia ( |  | 68,600 | 27,533 |  | * | * | * |
|  | Sulfuric Acid, 50% ( | $6,500,000) | 220,000 |  |  |  |  |  |
|  | " " , 90% ( |  | 44,000 |  |  |  |  |  |
|  | Nitric Acid, 50% ( |  | 33,000 | 25,154 |  |  |  |  |
|  | " " , 90% ( |  | 4,500 | 3,043 |  |  |  |  |
| S.M.R. Chemical | Caustic Soda | Not available | 3,000 |  |  | 0** | 0** | 0** |
| Factory; Mukden | Hydrochloric Acid |  | 3,000 | 1,510 | 2,500 |  |  |  |
| Manchu Soda Company; | Caustic Soda ( |  | 3,000 |  | 1,170 | 100% | 100% | $200,000 |
| Kaiyuan | Hydrochloric Acid ( |  | 2,000 |  | - |  |  |  |
| Manchu Soda Company; | Caustic Soda ( | 5,850,000) | 3,000 | 2,120 | 1,590 | 0 | 0 | 0 |
| Dairen | Soda Ash ( |  | 60,000 | 57,480 | 44,330 |  |  |  |
|  | Bleaching Powder ( |  | - | 2,010 | 920 |  |  |  |
| S.M.R. Oil-Shale | Am. Sulfate | Not available | 38,000 | 20,790 | 11,910 | 5% | 10% | 100,000 |
| Plant; Fushun | Sulfuric Acid |  | 72,000 | 3,040 | 16,650 |  |  |  |
|  | Am. Nitrate |  | 2,000 | - | - |  |  |  |
| Manchu Iron Company; | Am. Sulfate | " " | 41,000 | 23,800 | 16,000 | 7% | 77% | 50,000 |
| Anshan | Sulfuric Acid |  | 5,000 | 220 | 1,640 |  |  |  |
| Manchu Mining Company; Hulutao | Sulfuric Acid | " " | 10,000 | - | 1,700 | 0 | 0 | 0 |
| Mukden Soda Company; | Caustic Soda | 1,875,000 | 7,500 | 960 | 1,040 | 0 | 0 | 0 |
| Mukden | Hydrochloric Acid |  | 750 | 650 | 330 |  |  |  |
|  | Bleaching Powder |  | - | 1,300 | 350 |  |  |  |

---

* Japanese report refers to news reported by "vernacular" paper, stating that 80% of equipment of this plant has been moved to Siberia. Estimated value of this would be about $3,000,000, but report unverified.

** No removals reported by Chinese or Japanese sources.

## TABLE C-3

## OILS, FATS AND PAINT PLANTS

| Plant | Products | Annual Capacity Before Aug. 15, 1945 (Metric Tons) | Reduction of Capacity by Removals (%) | % of Original Equipment Removed (%) | Weight of Equipment Removed by Soviets (Metric Tons) | Approximate Value (U.S. $) | Weight of Materials & Supplies Removed (M.T.) | Approximate Value (U.S. $) |
|---|---|---|---|---|---|---|---|---|
| Manshu Oil & Fat Co., Ltd.; Mukden | Soap & fatty acid<br>Glycerine | 5,000<br>300 | 0 | 0 | 0 | 0 | 3,488 | 669,695** |
| Manshu Kyodo Oil & Fat Co.; Mukden | Soap | 650 | 0 | 0 | 0 | 0 | 380 | 10,450** |
| Manshu Oil & Fat Co., Ltd.; Dairen | Soap<br>Hardened oil | 500<br>12,000 | 0 | 0 | 0 | 0 | 1,440 | 414,000** |
| Manshu Oil & Fat Co., Harbin | Soya oil | 22,000[a] | - | - | - | - | - | - |
| Manshu Cottonseed Ind. Co., Ltd., Liaoyang | Cottonseed oil<br>Cottonseed cake | 1,200<br>5,200 | 0 | 0 | 0* | 0 | 400 | 200,000** |
| Harbin Oil Co., Harbin | Oil | 2,000[b] | - | - | - | - | - | - |
| Kansai Paint Co., Ltd., Mukden | Paint | 5,000 | 50 | 20 | 50 | 50,000** | 480 | 250,000** |
| Manchu (Japan) Paint Co., Ltd., Mukden | Paint<br>Zinc oxide | 15,000<br>1,000 | 0 | 0 | 0 | 0 | 300 | 150,000** |
| Honen Oil Mill, Dairen | Soya bean oil | 15,000 | - | - | - | - | - | - |

(Table C-3, Oils, Fats and Paint Plants, Cont'd)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Manshu Soya Bean Ind. Co., Ltd., Dairen | Soya bean oil | 30,000 | - | - | - | - | - | - |
| Santai Oil Mill, Dairen | Soya bean oil | - | - | - | - | - | - | - |
| Mitsubishi Co., Ltd., Dairen | Soya bean oil | - | - | - | - | - | - | - |
| Soya Bean Chemical Ind., Co., Ltd., Dairen | Soya bean oil | - | - | - | - | - | - | - |

---

a Production in 1944 amounted to 2,830 tons.
b Production in 1944 amounted to 1,260 tons.
* Negligible pilferage.
** Chinese estimate.

## TABLE C-4

## NATURAL RUBBER INDUSTRY

| Plant | Products | Capitalization or Estimated Value (Million $) | Annual Capacity before August 15, 1945 (M.T.) | Reduction of Capacity by Removals (%) | Weight & % of Original Equipment Removed (M.T.) | Approximate Value (U.S. $) | Weight of Materials & Supplies Removed (M.T.) | Approximate Value (U.S. $) |
|---|---|---|---|---|---|---|---|---|
| Toyo Tire Co., Ltd., Mukden | Motor car tires, belts, etc. | 3.51 | 4,000 | 100 | 1,641<br>100% | 500,000 | 5,500 | 1,000,000* |
| Bando Belting Co., Ltd., Mukden | Belting | 0.23 | 1,500 | 100 | 1,373<br>95% | 80,000 | 500* | 79,000* |
| Kokka Rubber Co., Ltd., Mukden | Rubber shoes & belts | 0.52 | 1,860 | 70 | 350<br>50% | 100,000 | 1,500* | 262,000* |
| Manchu Rubber Co., Ltd., Liaoyang ** | Motor car tires, belts, shoes, etc. | 2.0 | 3,500 | 100 | 1,761<br>95% | 550,000 | 6,500* | 1,200,000* |

---

* Chinese estimate - unverified.

** Building from which equipment was removed reported to have burned down after the departure of the Soviet forces.

## TABLE C-5

## EXPLOSIVES PLANTS

| Plant | Products | Capacity (MT/yr) | Equipment Removals (%) | Value (U.S. $) | Value of Material Removals (U.S. $) | Reduction in Capacity due to Removals (%) |
|---|---|---|---|---|---|---|
| Manchurian Explosives Company, Mukden | Am. Nitrate Explosive | 3,200 | 0 | 0 | - | 0 |
| Manchurian Explosives Company, Liaoyang | TNT and Picric Acid | 5,100 | 5 | 33,700 | - | 60 |
| Manchurian Explosives Company, Fouhsin | Fuses and Detonators | 4,000 | 50 | 264,000 | - | 60 |
| Manchurian Explosives Company, Antung | Fuses and Detonators | 2,000 | - | - | - | - |
| Manchurian Explosives Company, Fushun | Fuses and Detonators | 90,000,000 pcs. (Est. 2,500 T) | 40 | 264,000** | 150,000 | 70 |
| *Mukden Arsenal Smokeless Powder Plant, Mukden | Smokeless Powder | 600 | 100 | 160,000 | - | 100 |
| Manchurian Explosives Company, Fushun | Am. Nitrate Explosive | 1,788 | 0 | 0 | - | 0 |

---

* Plant and materials destroyed by Soviet Army by exploding stored explosives.

** This figure probably high. (See File 202-C-1)

## TABLE C-6

## MISCELLANEOUS CHEMICAL PLANTS

| Plant | Products | Capacity (MT/yr) | Equipment Removals by Soviet Forces (%) | Estd. Value of Equipment Removed (U.S. $) | Reduction in Capacity Due To Removals (%) | Amt. and Value of Materials Removed |
|---|---|---|---|---|---|---|
| Koa Graphite Industry Company, Kirin | Purified Graphite | 1,200 | 50 | 125,000* | 100 | ** |
| Manchu Carbon Industry Company, Antung | Electrodes & Crucibles | 5,000 | Unknown | - | - | - |
| Tokai Electrode Mfg. Company, Antung | Electrodes | 5,000 | Unknown | - | - | - |
| Kirin Match Company, Ltd., Kirin | Matches,<br>Splints, &<br>Lumber | 32,600 pkg.<br>61,900 "<br>6,000 $M^3$ | 20<br>0<br>0 | 100,000*<br>0<br>0 | 100<br>0<br>0 | *** |

---

* Higher estimates given by Japanese in Source File 304-X-1 appear entirely unjustified.

** A Japanese estimate of removal of 250 T of graphite valued at $37,500 is given in Source File 304-X-1. Unverified.

*** A Japanese estimate of removal of 100 $M^3$ of logs and 3,133 pkgs. matches valued at $6,594,250. Unverified as to quantity and value.

## TABLE C-7

## SUGAR REFINERIES

| Plant | Capacity (MT/yr) | Production 1942 (M.T.) | Production 1943 (M.T.) | Production 1944 (M.T.) | Equipment Removed by Soviet Forces | Equipment Reported Destroyed by Local Pop. (%) | Equipment Destroyed by Fire Prior to End of the War (%) | Reduction in Capacity (%) |
|---|---|---|---|---|---|---|---|---|
| Manchuria Sugar Refinery, Changchun | 10,000 | 7,950 | 3,860 | 6,000 | 0 | 0 | 90 | 100 |
| Manchuria Sugar Refinery, Harbin | 8,000 | 4,070 | 1,210 | 4,670 | 0 | 90<br>(Est. Val. $400,000) | 0 | 100 |
| North Manchuria Sugar Refinery, Acheng | 6,670 | 6,830 | 4,180 | 6,000 | ** | ** | ** | ** |
| Manchuria Sugar Refinery, Mukden | 5,500* | 5,170 | 2,000 | 0 | 0 | 0 | 0 | 0 |
| TOTAL: | 30,170 | | | | | | | |

---

* Converted to alcohol.

** None reported by Chinese or Japanese sources.

## TABLE C-8

## TOBACCO COMPANIES

| Plant | Cigarette Capacity Per Year (1,000,000) | Production 1943 (1,000,000) | Production 1944 (1,000,000) | Equipment Removals by Soviet Forces (%) | Estd. Value of Equipment Removed ($) | Reduction in Capacity Due to Removals (%) | Additional Reduction in Capacity Due to Damage** (%) |
|---|---|---|---|---|---|---|---|
| Chuo Tobacco Co.,<br>Harbin<br>Mukden<br>Yingkow | 10,000 | 9,570 | 7,000 | 0 | 0 | 0 | 30 |
| Manchuria Tobacco Co.,<br>Changchow<br>Mukden<br>Yingkow | 8,700 | 8,340 | 6,000 | 0 | 0 | 0 | 30 |
| Kyowa Tobacco Co.,<br>Mukden<br>Harbin | 2,400 | 2,300 | 1,680 | 50 | 1,200,000 | 50 | -- |
| Taiyo Tobacco Co.,<br>Mukden | 2,750 | 2,640 | 1,910 | 0 | 0 | 0 | 28 |
| Dosin Tobacco Co.,<br>Antung | 150 | 150 | 110 | 0 | 0 | 0 | 27 |
| TOTAL: | 24,000 | | | | | | |

---

* See Source File 303-NR-4-1.

** Probably by native population.

# CHAPTER XI

## CEMENT INDUSTRY

Of the fourteen cement plants in Manchuria all of the nine located in Chinese Nationalist territory and one of the four in Chinese Communist territory were inspected by the Mission.

Three plants in Chinese Communist territory and one plant in Dairen were not inspected because permission to visit those locations could not be secured from the Chinese Communists or the Soviets respectively.

Very complete data on the entire cement industry was secured from Japanese officials intimately connected with that industry and who were still in Manchuria awaiting repatriation at the time the Pauley Mission made its survey. These data checked accurately with the finding of the Mission at the plants actually visited and are therefore considered equally correct for all the plants. The Japanese report on the industry will be found in Source file 303-H-1.

### History

In order to supply material for railroad construction, the first small cement plant was established at Dairen in 1909. It was enlarged twice but the real beginning of the cement industry as such was in 1933. From then on the Japanese constructed plants throughout Manchuria until in 1945 there were a total of fourteen with an overall annual capacity of better than two million tons. The ownership of the last thirteen is definitely Japanese. It was vested in five Japanese owned and controlled companies, the three larger concerns having eleven plants. (See accompanying Table H-1 for details). Information available indicates the Dairen plant was owned by the South Manchurian Railroad.

As cement was essential to further Japanese industrial development in Manchuria, it was classified as one of the "important industries" and came under Manchukuo Government direction. It was a part of the various "Five Year Plans" and in 1938 the government organized the Manchuria Federated Cement Company for the purpose of controlling the industry. Prices were set and production regulated (mostly increased) by this organization which was made up of the principal producers.

### Geographical Distribution

To minimize transportation costs, the cement plants were located adjacent to sources of raw materials (limestone, clay, blast furnace slag) and as near as possible to industrial centers or wherever there was considerable need for cement in construction work. This gave wide distribution throughout Manchuria. Six of the fourteen plants were concentrated in the Fushun, Anshan, Chinhsi industrial triangle; two were located near the eastern USSR border at Mutanchiang and Mioaling to meet both industrial and military construction requirements; and one in Kirin for construction of the Ta-feng-men Dam on the Sungari River. The accompanying map shows the locations of all the plants.

## Economic Summary

### (a) Capacity as of 15 August 1945

The annual capacity of the fourteen plants as stated by the Manchurian Cement Control Union in 1944 was 2,200,000 metric tons. This collective figure was the capacity of the machinery and equipment in each plant and is considered effective for 15 August 1945. Following is a breakdown (in metric tons) by individual cement plant:

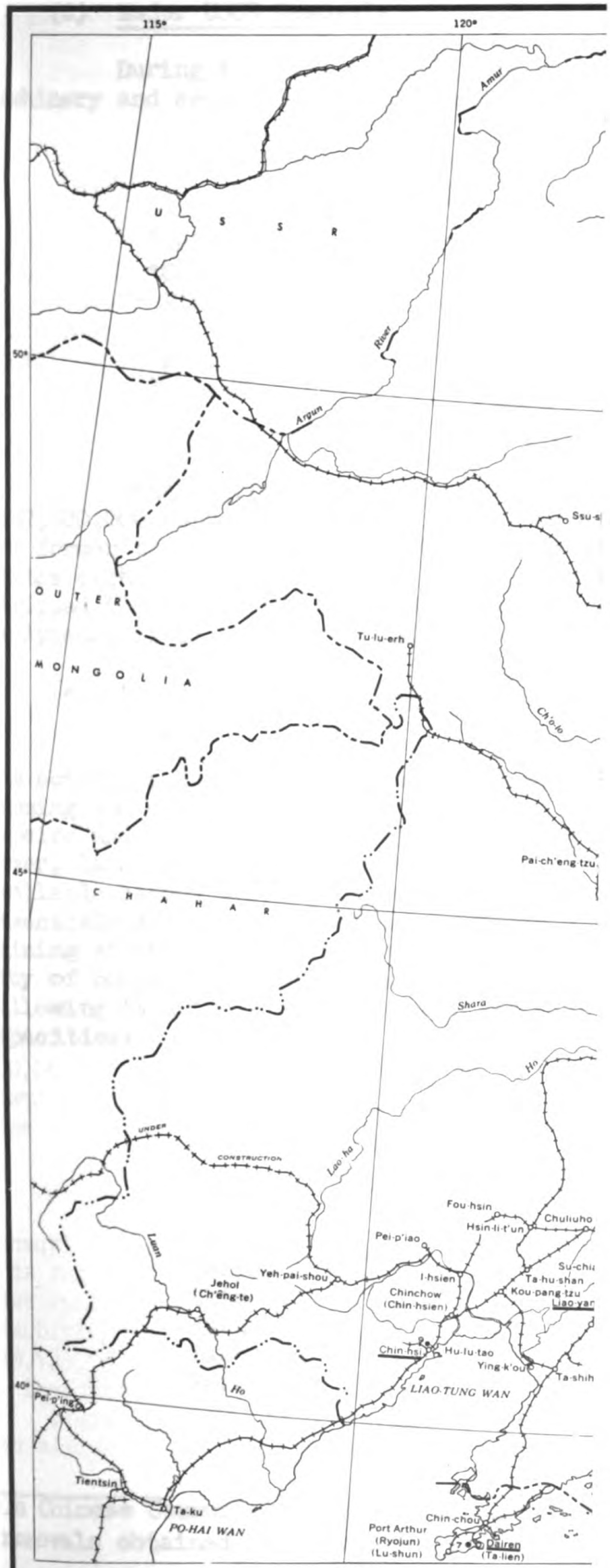
| | | |
|---|---|---|
| 1. | Harbin | 110,000 |
| 2. | Mutanchiang | 100,000 |
| 3. | Changtu | 140,000 |
| 4. | Anshan | 200,000 |
| 5. | Hsiao-tung | (included with Anshan) |
| 6. | Miaoling | 90,000 |
| 7. | Dairen | 210,000 |
| 8. | Kirin | 260,000 |
| 9. | Chinhsi | 150,000 |
| 10. | Fushun | 210,000 |
| 11. | Liaoyang | 180,000 |
| 12. | Penchihu | 250,000 |
| 13. | Kungyuan | 170,000 |
| 14. | Antung | 130,000 |
| | Total. . . | 2,200,000 |

### (b) Peak Production

In 1933, 184,843 tons of cement were produced in Manchuria. From then on there was a steady increase until 1943 when production dropped off slightly. The best year was 1942 with a total production of 1,532,131 tons. The difference between this figure and the 2,200,000 total capacity can be accounted for by shortages of raw materials, transportation difficulties, and lack of repair parts, all caused by the war.

### (c) Value of Equipment

The Manchurian Cement Association has given figures in Japanese yen for the value of machinery and equipment of each separate plant as of the end of 1943. (Source file 303-H-1) Using a 4.25 to 1 exchange ratio, these have been converted to US dollars and are shown on the individual cement plant summary reports in Appendix 11. Their total is 140,647,618 yen or about $33,000,000 which is considered fairly low when compared with the cost of plants of similar capacities in the United States. Therefore no hesitation is felt in using these value figures in this report.


115°
120°
Amur
U S S R
River
50°
Argun
Ssu-s
O U T E R
M O N G O L I A
Tu-lu-erh
Ch'o-lo
Pai-ch'eng-tzu
45°
C H A H A R
Shara
Ho
UNDER
CONSTRUCTION
Lao-ha
Luan
Fou-hsin
Hsin-li-t'un
Chuliuho
Pei-p'iao
Su-chia
Yeh-pai-shou
I-hsien
Ta-hu-shan
Jehol
(Ch'eng-te)
Chinchow
(Chin-hsien)
Kou-pang-tzu
Liao-yan
Chin-hsi
Hu-lu-tao
Ying-k'ou
Ta-shih
Ho
40°
Pei-p'ing
LIAO-TUNG WAN
Tientsin
Ta-ku
PO-HAI WAN
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
120°

(d) Major USSR Removals

During the Fall of 1945, the Soviet Army removed the principal machinery and cement manufacturing equipment from six plants as follows:

| | Annual Capacity (MT) | Actual Dollar Value of Plant |
|---|---|---|
| *Mutanchiang | 100,000 | $ 1,994,705 |
| *Changtu | 140,000 | 1,153,800 |
| Miaoling | 90,000 | 4,181,915 |
| Kirin | 260,000 | 1,641,371 |
| Kungyuan | 170,000 | 5,185,412 |
| *Antung | 130,000 | 3,643,252 |
| Total | 890,000 | $17,800,455 |

This represents about 40 per cent of the former rated capacity of 2,200,000 tons of all plants in Manchuria and about 54 per cent of the former total value of $33,000,000 leaving $15,000,000 for the value of the eight remaining plants. These figures show that the Soviets stripped the newer and more modern plants. (See plant inspection reports in Appendices 11 and Source file 303-H-1 for details.)

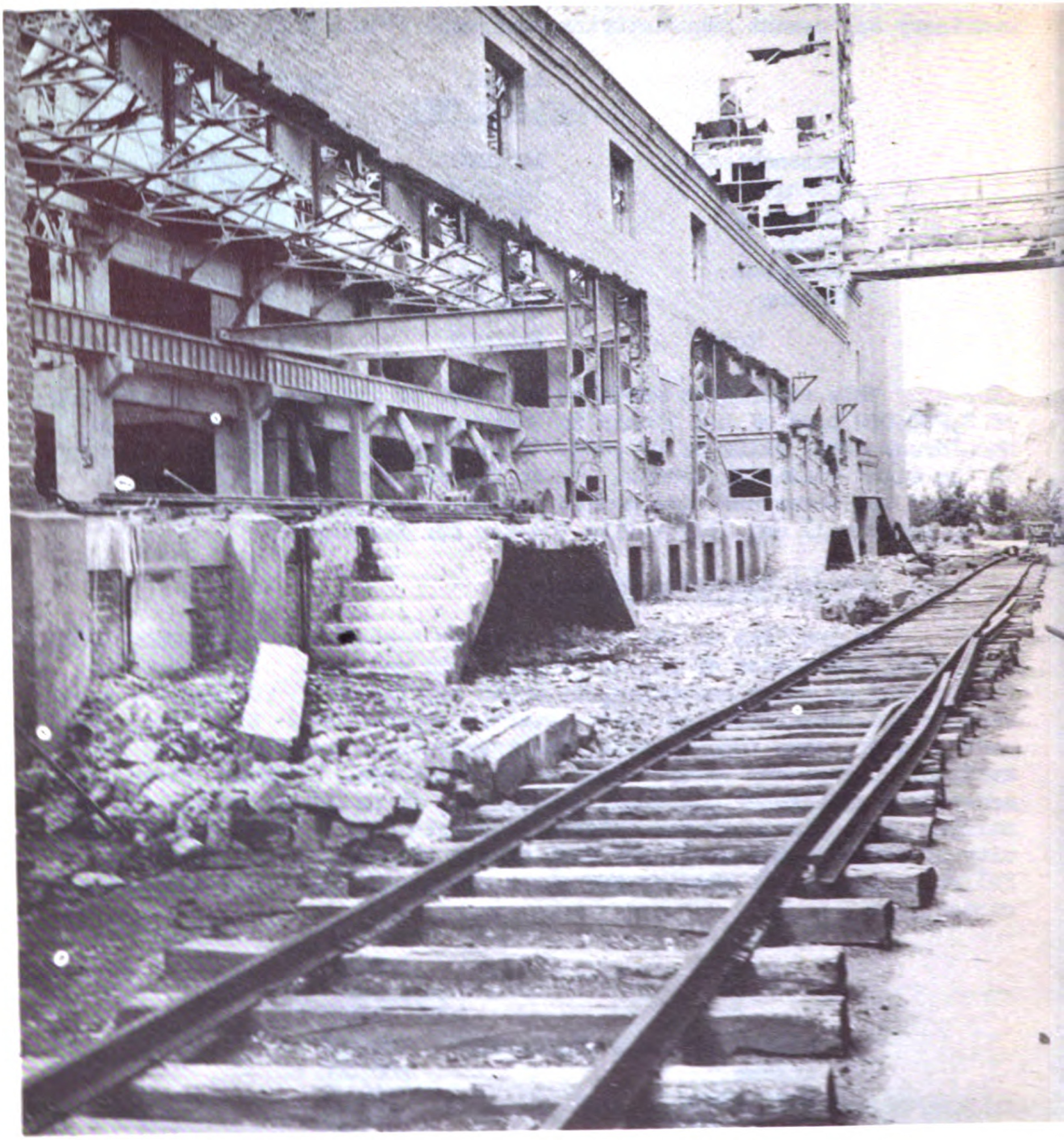
(e) Present Remaining Capacity

At the time of the Pauley Mission inspections (June-July 1946), the actual production of cement in Manchuria was zero. No plants were running and of those undamaged, it would require 30 to 90 days for minor repairs and rehabilitation before starting operations. Even then, coal, power, labor, some repair parts, and transportation would have to be available before any cement could be manufactured. However, given these essentials and proper operating conditions, it is estimated that the remaining eight plants of the original fourteen have a total annual capacity of 600,000 (MT) or 27 per cent of the original rated capacity. Following is a table showing the eight plants and their present estimated capacities:

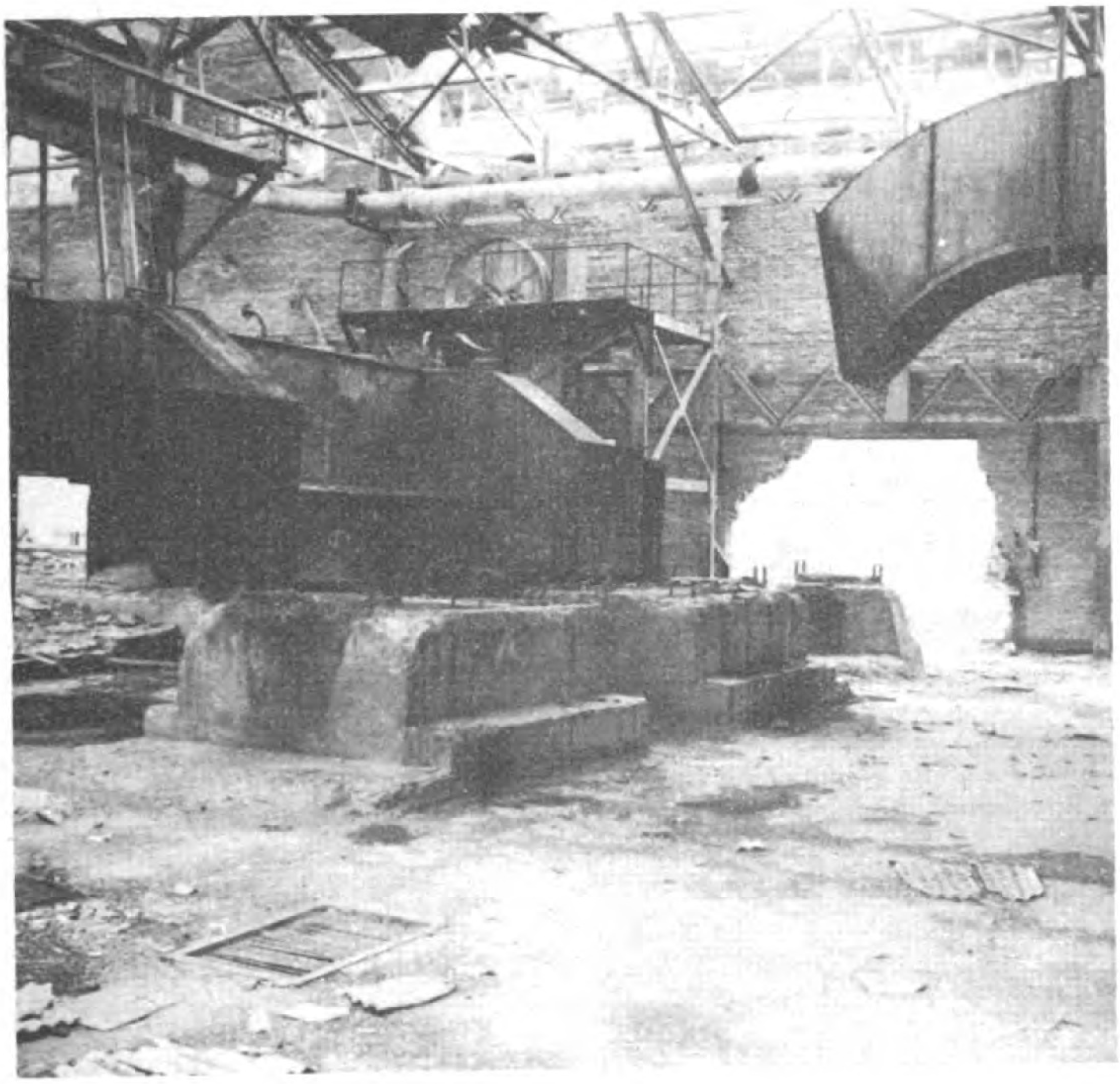
| | Annual Capacity (MT) |
|---|---|
| Harbin (Chinese Communists) | 30,000 |
| Anshan | 100,000 |
| Hsiao-tung | 50,000 |
| Dairen (USSR) | 100,000 |
| Chinhsi | 50,000 |
| Fushun | 80,000 |
| Liaoyang | 90,000 |
| Penchihu | 100,000 |
| Total | 600,000 |

---

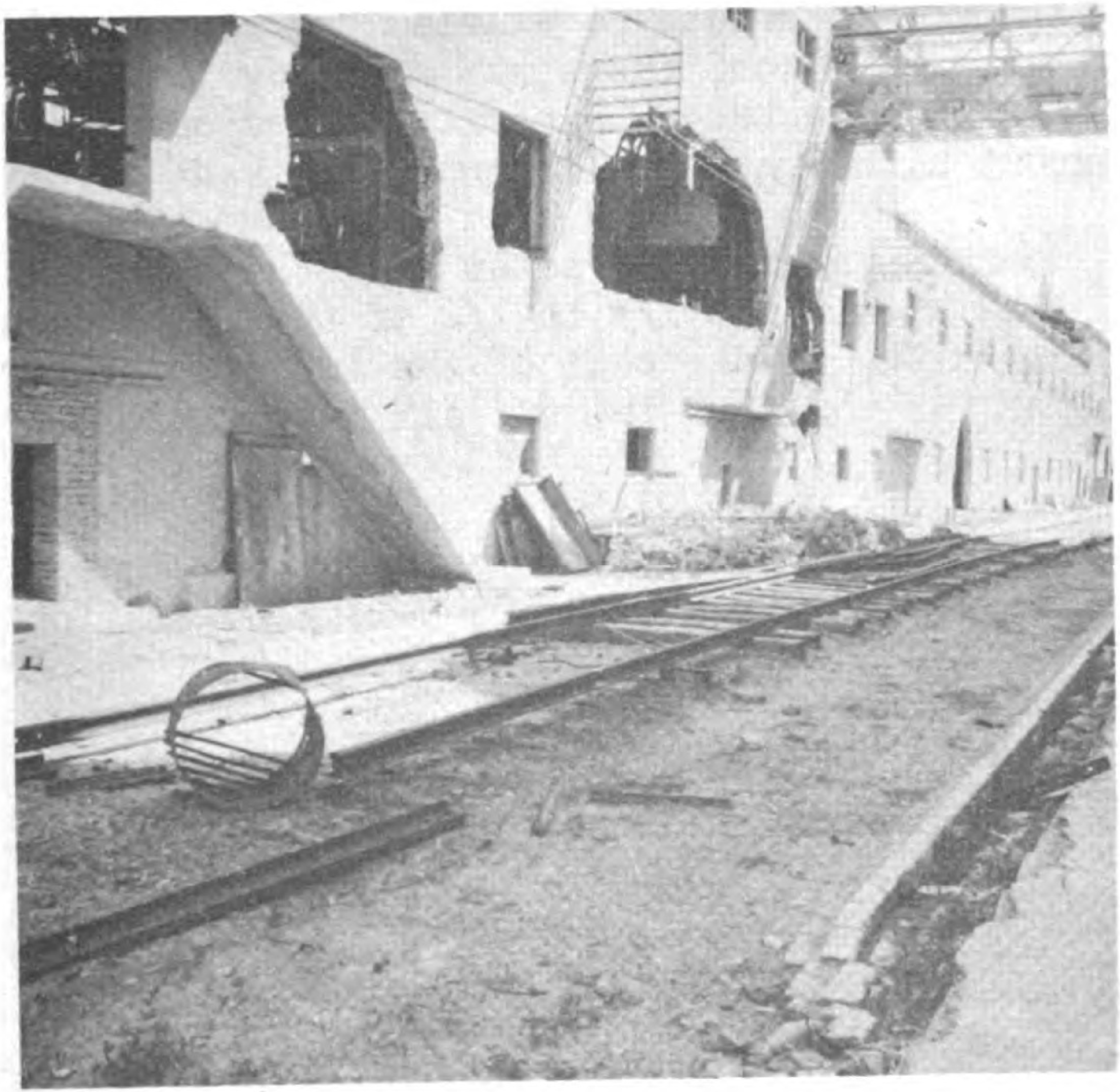
*In Chinese Communist territory and not inspected by Mission. Data on removals obtained from Japanese sources.



KUNGYUAN CEMENT PLANT - Sections of building knocked out to permit Soviet removal of grinding equipment to railroad cars brought into plant on temporary tracks. Plant's clay pit is in right background.



KUNGYUAN CEMENT PLANT - Coal pulverizing and feed equipment removed through hole in wall.



Outside view of above building showing additional damage done by Soviets in loading machinery.

The difference between the present production capacity and that theoretically remaining after deducting the loss due to major Soviet removals amounts to 710,000 metric tons, or 33 per cent. This represents the loss in capacity due to limited removals by the Soviet, looting of small pieces of equipment (electric motors, tools, conveyor belts) by local Chinese, and reduction in output due to normal wear on some of the machinery.

### (f) Dollar Value Lost and Reduction in Capacity Due to Soviet Removals

The losses in capacity and value due to Soviet removals in the major plants are shown in paragraph (d) above and are 890,000 MT and $17,800,000 respectively. In addition the Soviets are also considered to be responsible for one third of the loss in capacity and value in the remaining plants. This is estimated to total 710,000 MT and $15,000,000. One third or 230,000 MT and $5,000,000 is considered a just amount.

For the entire cement industry, this gives a grand total of about 1,100,000 MT or a 50 per cent reduction in cement manufacturing capacity and about $23,000,000 loss or 70 per cent of the former value, all of which are the results of Soviet Army's activities.

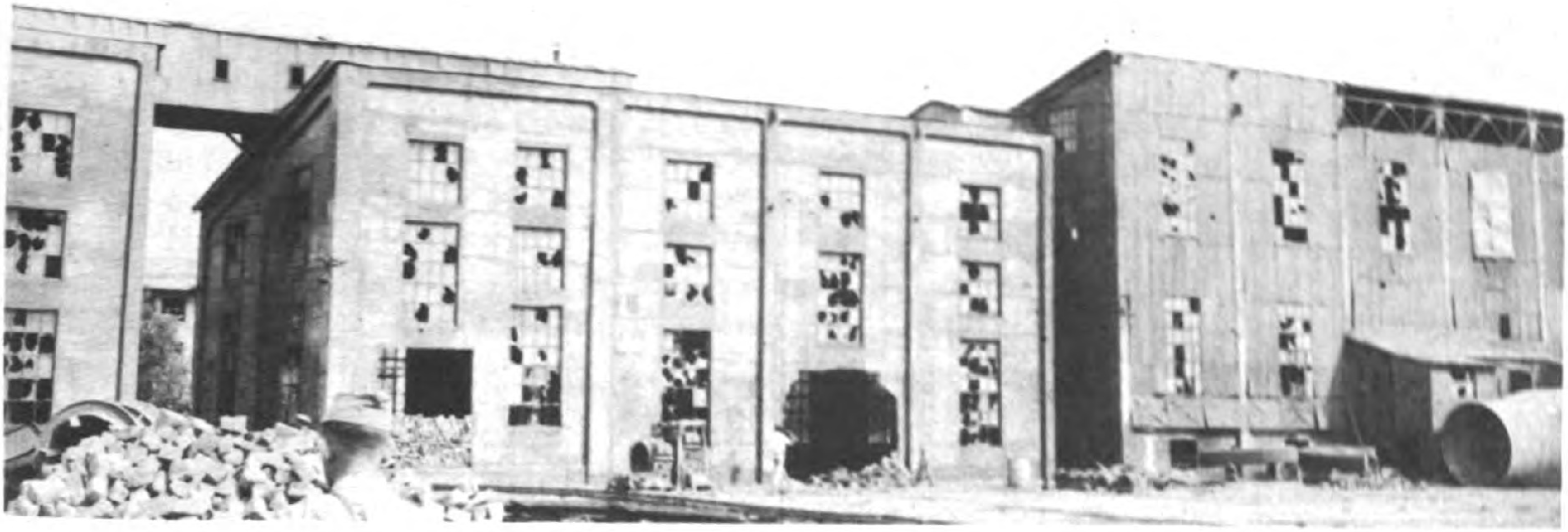
## Discussion of the Industry

The cement industry of Manchuria was entirely a Japanese enterprise and its establishment and growth paralleled the industrial development of the country. From 1909 on, there was a steady increase in cement production. It was manufactured primarily for consumption and was not intended for export although a small amount was sent to China.

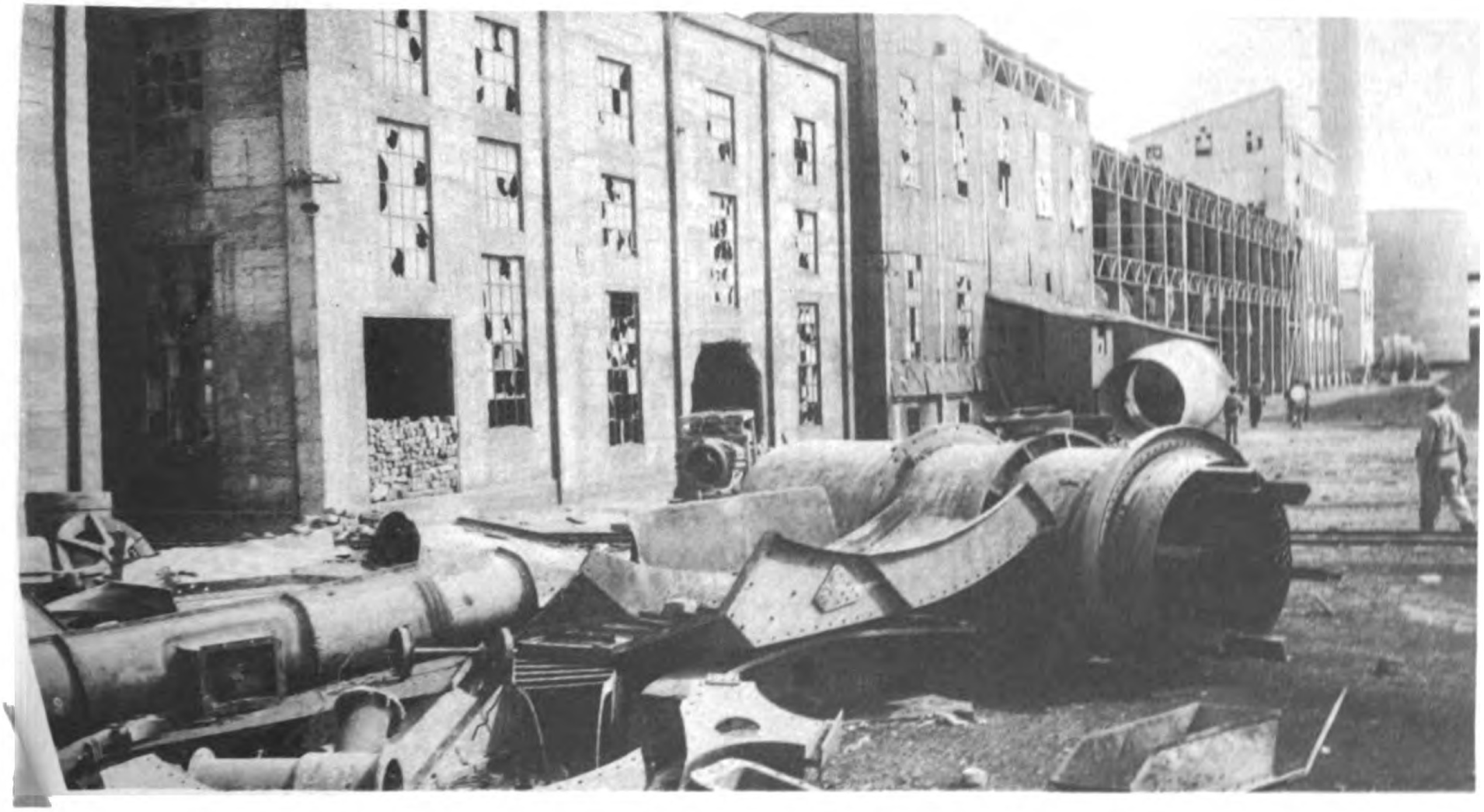
The local demand was always greater than the domestic supply, particularly before 1942 when about 1/3 to 1/2 of the total cement used was imported. Approximately 80 per cent of the imports were from Japan but after the start of the war with the US, all importing dropped off due to lack of shipping.

Listed below are excerpts from a table showing demand, domestic production, and imports (Source file 303-H-1) illustrating the almost constant rise in all three categories:

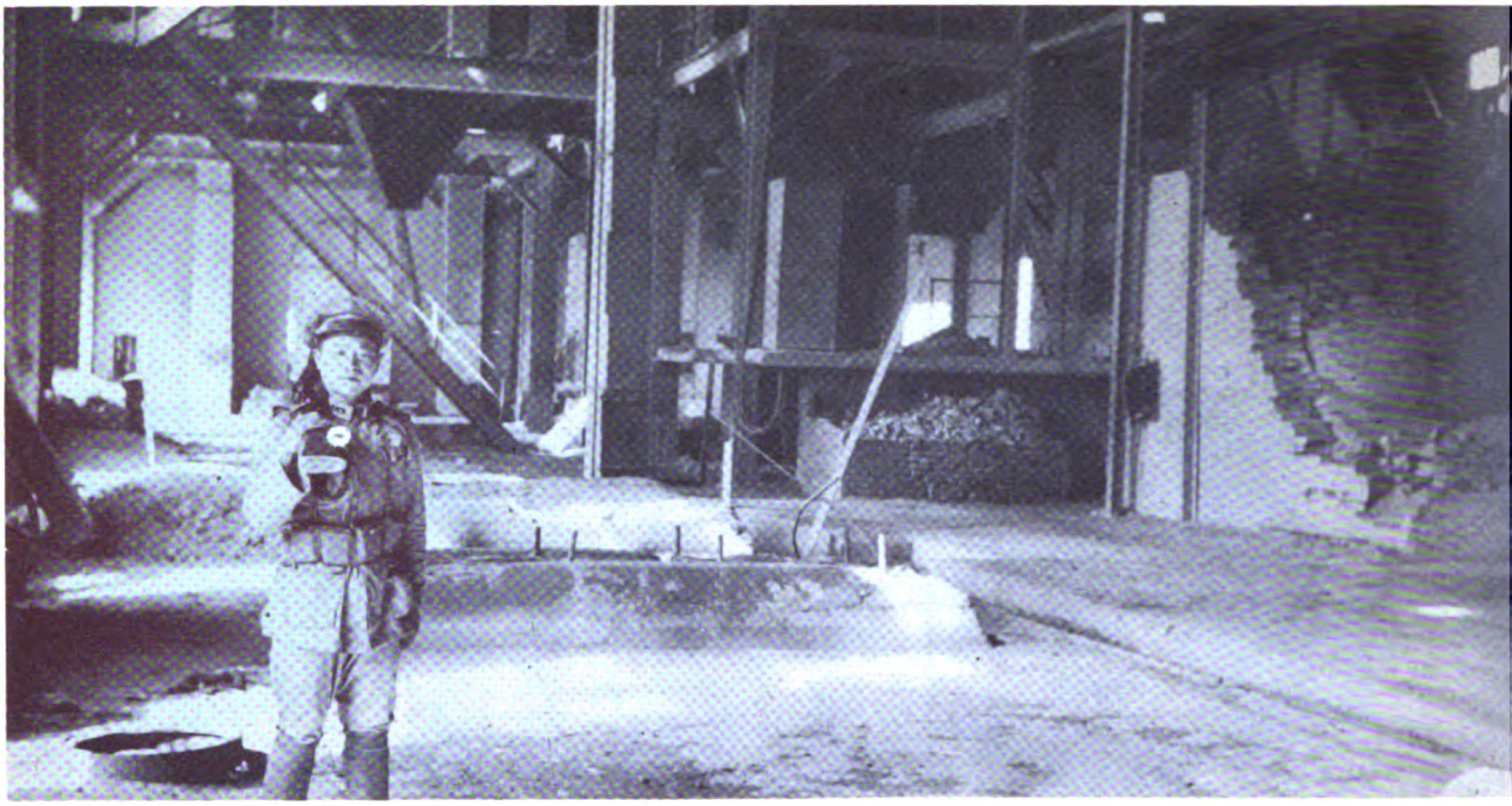
| Year | Domestic Production | Import | Demand |
|---|---|---|---|
| 1927 | 62,446 | 69,186 | 131,632 |
| 1930 | 90,649 | 46,796 | 137,445 |
| 1933 | 163,317 | 155,922 | 319,239 |
| 1936 | 457,724 | 168,895 | 626,619 |
| 1939 | 1,018,360 | 550,325 | 1,568,685 |
| 1942 | 1,393,302 | 43,048 | 1,436,350 |



CHANGTU CEMENT PLANT - The Soviets stripped this plant of essential machinery. Sections of the building walls were broken in order to remove the larger equipment.



Pieces of equipment probably intended for shipment but rejected after being dismantled.



CHANGTU CEMENT PLANT - Interior view showing foundations of crusher and conveyor equipment removed by U.S.S.R.

HSIAOTUNG CEMENT PLANT - Nationalists' best undamaged but smallest plant. Plans now underway to reopen. (Former Japanese manager in center of railroad tracks)

Cement was used by all classes of industry for the construction of railroads, hydro-electric power dams, steel mills, airports, highways and other structures necessary for Japan's expansion in Manchuria. Military needs took up a large proportion of the available supply. Following is a table showing distribution for 1943 and 1944 (from Source file 302-Y.1-1, page 53):

| | 1943 (MT) | 1944 (MT) |
|---|---|---|
| Military | 691,751 | 397,945 |
| Transportation | 257,089 | 149,279 |
| Government | 103,452 | 68,503 |
| Munitions Industry | 8,880 | 23,416 |
| Important Industry | 412,524 | 426,361 |
| Public | 25,002 | 40,005 |
| Export-China | 15,306 | 21,992 |
| Total | 1,514,004 | 1,127,501 |

The cost of manufacture in Manchuria was about the same as in Japan. Chinese labor costs were lower but was offset by the higher wages paid to the Japanese. Price analysis of cement as given in Japanese reports is as follows:

| Coal | Labor | Upkeep Expense | Container | Depreciation | Interest |
|---|---|---|---|---|---|
| 47.7% | 15.9% | 9.5% | 15% | 7.9% | 4% |

In the above analysis, the cost of raw materials such as limestone and clay would be a part of labor, upkeep, and depreciation as these materials were obtained from quarries and pits adjacent to the plants and using the plants own workmen, and excavating equipment.

## Future Outlook

Raw materials for cement exist in Manchuria in sufficient quantities for continued large-scale manufacturing but the loss of electric power, skilled labor, replacement parts, and coal transportation will retard restarting of existing plants. Plans are underway for resumption of activities at the Hsiaotung plant by the Ministry of Economic Affairs, but it will be some time before any production will be available. The capacity that remains of the former Japanese plants will not be enough to meet the demand. Cement will have to be imported or measures taken to restore production to some where near its former figures.

## Notes on Removals

The six plants which suffered major removals by the Soviets were the most recently constructed and equipped with the newest machinery.

The equipment which seemed to be particularly desired was the crushing, grinding, and pulverizing equipment, electric motors, generators, laboratory and testing equipment, and inter-plant haulage equipment. In one plant (Kirin) an attempt was made to cut the rotary kilns into sections and remove them. Fabricated fixtures were not ordinarily removed but they were usually badly damaged. Severe and wholly unnecessary damage to auxiliary equipment and buildings was characteristic of almost all stripped plants inspected by the Pauley Mission. There was a general appearance of complete devastation, probably due to the haste with which the Soviets were compelled to operate. (The accompanying photographs show the result of moving equipment through building walls so it could be loaded at an improvised railway spur.) The nature of the removals has been such that restoration to former capacity of the plants affected will require almost complete rebuilding of the entire facilities.

## TABLE H-1

## RECAPITULATION OF SUMMARY INFORMATION

| Ownership or Company | Location and Map Reference Number | Capacity of Machinery; MT Per Year | Best Production and Year MT | Soviet Removal or Destruction | Reduction in Capacity due to Soviet Removals | Present Capacity MT Per Year |
|---|---|---|---|---|---|---|
| Manchuria Onoda Cement Company | Harbin (1) | 110,000 | 79,301 (1943) | None | Zero | 30,000 |
| | Mutanchiang (2) | 100,000 | 71,598 (1941) | Large | 100% | Zero |
| | Changtu (3) | 140,000 | 108,142 (1942) | Large | 100% | Zero |
| | Anshan (4) | 200,000 | 141,160 (1942) | Small | Zero | 100,000 |
| | Hsiao-tung (5) | included with Anshan capacity | 95,106 (1944) | None | Zero | 50,000 |
| Toman Cement Co. | Mioaling (6) | 90,000 | 36,447 (1943) | Large | 100% | Zero |
| Kwantung-shu Ononda Cement | Dairen (7) | 210,000 | 172,047 (1942) | None | Zero | 100,000 |
| Manchuria Asano Cement Company | Kirin (8) | 260,000 | 223,436 (1942) | Large | 100% | Zero |
| | Chinhsi (9) | 150,000 | 111,709 (1943) | Small | Zero | 50,000 |
| | Fushun (10) | 210,000 | 181,104 (1942) | Small | Zero | 80,000 |
| Manchuria Iwaki Cement Company | Liaoyang (11) | 180,000 | 150,623 (1942) | Small | Zero | 90,000 |
| | Penchihu (12) | 250,000 | 204,331 (1942) | Small | Zero | 100,000 |
| | Kungyuan (13) | 170,000 | 91,999 (1943) | Large | 100% | Zero |
| Antung Cement Company | Antung (14) | 130,000 | 95,101 (1943) | Large | 100% | Zero |

The above table was compiled from Individual Cement Plant Summary Reports in Appendix 11.

# CHAPTER XII

## TEXTILES

### A. BRIEF HISTORY OF THE INDUSTRY

The textile industry is one of Manchuria's oldest industries. It was not until the Japanese invasion of Manchuria in 1931, however, that the industry was modernized. Prior to that time most of the industry was at a handicraft or domestic level.

The Japanese gradually assumed control of the textile industry and beginning about 1937 efforts were made to expand it in order to meet Japan's increasing needs due to her war program. Previously possible conflict between the textile industries of Manchuria and Japan had been a deterrent to expansion. To aid in increasing production in 1944 the Japanese organized the Manchuria Textile Corporation with a paid-in capital of 10 million yen. This organization took control of all phases of the textile industry, including the distribution of the manufactured product.

Manchuria has never been able to produce sufficient textiles to meet her domestic consumption except in the case of tusser or raw silk. Her cotton is of a coarse texture which is more suitable for padding and stuffing than spinning. Manchuria's domestic wool is also of inferior quality and has been used mainly in making low-grade woolen cloth, felt blankets and rugs.

There had been a steady increase in the capital investment in the textile industry. In 1934 the industry had an authorized capital of 22 million yen and a paid-up capital of approximately 13 million. The authorized capital increased to 87 million in 1938 and to 164 million in 1942, with the paid-up capital rising to 50 million and 111 million for the years 1938 and 1942 respectively. Little authenticated information is available as to the total capital investment in the textile industry for the year 1945. Advice obtained from the Economic Commission of Northeastern China (Source File 302-Y.1-1), however, shows that the capitalization of the principal cotton spinning mills was 182 million yen and of the principal woolen mills, 85 million yen.

### B. GEOGRAPHICAL DISTRIBUTION OF TEXTILE PLANTS

There are approximately twenty-five major textile plants in Manchuria. The accompanying map shows the names and locations of the principal plants. It will be noted that the largest concentration of plants is at Mukden.

Four plants are located in the Kwantung Province which is at present under Soviet control and two are at Harbin which is now held by the Chinese Communists. (June-July 1946)

### 1. Cotton

The increase in the capacity for production of cotton yarn and cotton piece goods is best illustrated by the number of spindles and looms. In 1936 Manchuria had a total of 254,590 spindles and 2,925 looms. In 1939 there were 356,972 spindles and 7,047 looms, and in 1945, 541,172 spindles and 16,236 looms.

### 2. Woolens

The principal woolen company was the Manchurian-Mongolian Woolen Company in Mukden with a capitalization of 80 million yen and a fabricating capacity of about one and a half million yards of woolen fabrics per year, 316 metric tons of woolen yarn, 100,000 dozen hats and about 33,000 square yards of matting.

The second largest woolen plant in Manchuria was the Kotoku Woolen Weaving Company located at Harbin. It has a capacity of about 480,000 meters of woolen fabric per year. There were no other woolen textile companies of any size in Manchuria.

### 3. Flax, Hemp and Jute

Because of the heavy demand for gunny sacks the hemp-dressing industry in Manchuria is considered to be a very promising one. About 40 million new bags are required annually. The climate and soil of Manchuria are well noted for growing hemp, but to meet the demands additional hemp had to be imported. It was estimated that during 1945 Manchuria would be able to supply about 40 per cent of her gunny bag needs. Two companies, the Manchurian Hemp-Dressing Company in Dairen and the Mukden Hemp-Dressing Company have a combined capacity of almost 17 million bags.

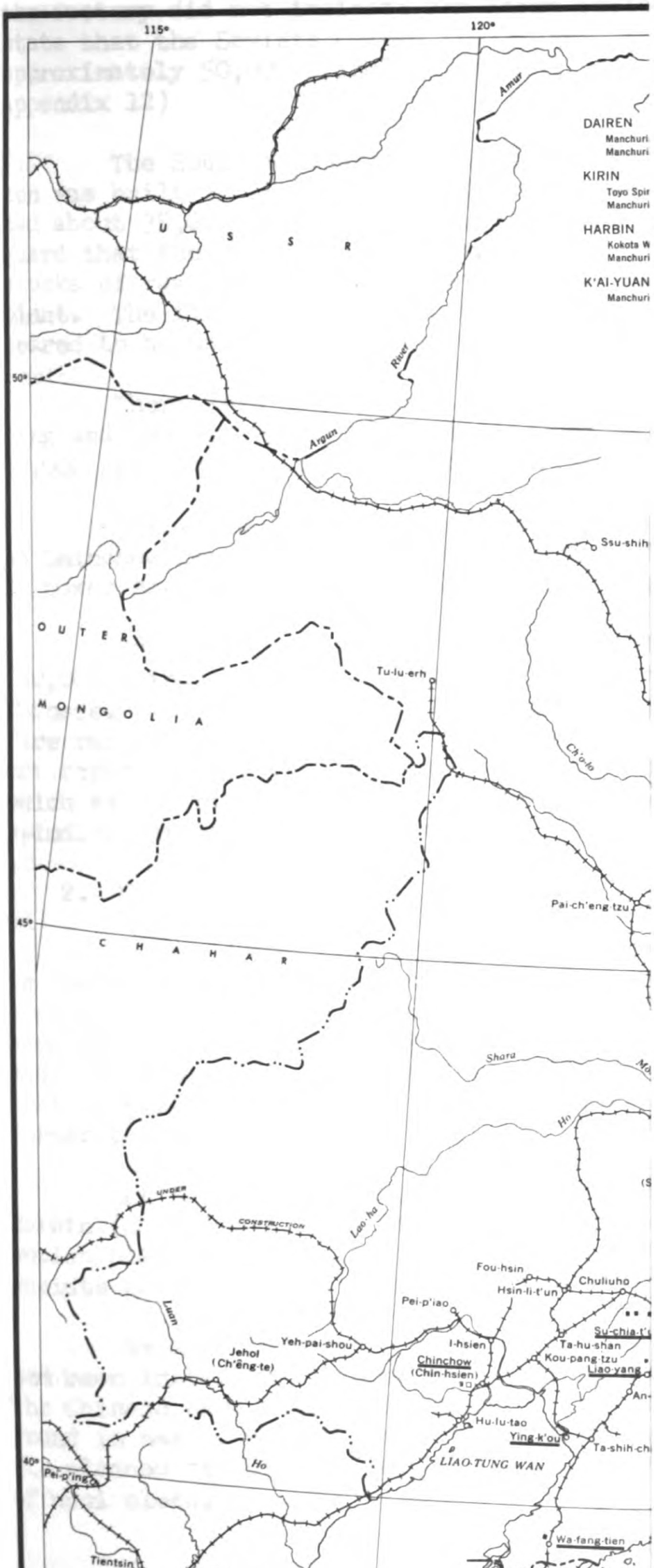
## C. REMOVALS

### 1. Cotton Spinning Plants

Five cotton spinning plants having a total of approximately 230,000 spindles were inspected. This represents about two-fifths of the capacity of the Manchurian cotton spinning industry.

At the Mukden Cotton Spinning Company which has approximately 30,000 spindles no equipment appeared to have been removed. A fire which the Chinese Nationalists state was set by the Soviets destroyed one building and about 400 spinning machines. (Plant Inspection Report 1-K-3 in Appendix 12)

The Toe Hai Cotton Spinning Company also located at Mukden was found to have been almost completely destroyed by fire. Inspection of


115°
120°
Amur
River
Argun
U S S R
OUTER MONGOLIA
CHAHAR
DAIREN
Manchuri
Manchuri
KIRIN
Toyo Spir
Manchuri
HARBIN
Kokota W
Manchuri
K'AI-YUAN
Manchuri
50°
45°
40°
Ssu-shih
Tu-lu-erh
Ch'o-lo
Pai-ch'eng-tzu
Shara
Ho
Lao-ha
UNDER CONSTRUCTION
Luan
Ho
Fou-hsin
Hsin-li-t'un
Chuliuho
Pei-p'iao
Yeh-pai-shou
Jehol
(Ch'êng-te)
I-hsien
Chinchow
(Chin-hsien)
Su-chia-t'
Ta-hu-shan
Kou-pang-tzu
Liao-yang
An-
Hu-lu-tao
Ying-k'ou
Ta-shih-ch
LIAO-TUNG WAN
Pei-p'ing
Tientsin
Ta-ku
PO-HAI WAN
Wa-fang-tien
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
120°

the factory did not indicate any large scale removals. The Chinese state that the Soviets burned the plant. This spinning company had approximately 50,000 spindles. (Plant Inspection Report 1-K-4 in Appendix 12)

The South Manchurian Cotton Spinning Company located at Suchiatun was built in 1942 and equipped with new machinery from Japan. It had about 35,000 spindles and 1,050 looms. We were informed by the plant guard that the Soviets had arrived at the plant in November 1945, removed stocks of raw cotton, one or two large motors and then set fire to the plant. The fire was largely confined to the roof and the machinery appeared to be undamaged, except by rust due to exposure.

There were no removals of equipment from the Manchu Cotton Spinning and Dyeing Company which is located at Liaoyang. This plant has 78,000 spindles and is the second largest in Manchuria.

Inspection of the Tung Mein Spinning and Weaving Company located at Chinchow revealed no removals of industrial equipment, other than 79 power sewing machines. This plant has approximately 50,000 spindles.

From the foregoing it is apparent that about 150,000 of the 230,000 spindles located in these five plants are available to the Chinese. The loss of the 80,000 spindle capacity was largely due to fire rather than the removal of equipment. Inasmuch as the Chinese did not report the removal of equipment from any cotton spinning plants which we did not visit, it is believed that from 400,000 to 450,000 spindles can still be operated.

### 2. Woolen Plants

It was found that the Manchurian and Mongolian Woolen Company in Mukden, which, as previously stated, is the principal woolen textile company in Manchuria and had 90 per cent of its industrial equipment removed. The Chinese manager of the plant stated that the Soviets had made the removals. This plant was so completely denuded of equipment that it would have to be completely rebuilt in order to produce at its former capacity.

At the time we inspected the Kotoku Woolen Weaving Plant at Harbin (June 1946) which as previously stated was the second largest woolen plant in Manchuria, it was being dismantled by the Chinese Communists presumably for installation at some other point.

We also inspected a small plant at Chinchow where the Japanese had been installing a gunny sack factory at the time hostilities ceased. The Chinese have installed equipment for fabricating wool which was found in nearby warehouses. The Soviets made no removals at this plant. Its planned capacity is 60,000 yards of worsted cloth and 40,000 yards of wool cloth.

### 3. Hemp, Jute and Flax

A jute sack factory at Liaoyang was inspected and no removals were found. This plant has a capacity of about 3 million gunny sacks per year. It cannot be operated at present however because its source of power at Fushun was removed by the Soviets. Four large transformers had been damaged but not removed. The plant manager stated that Chinese Communists had done the damage.

An attempt was made to inspect the Manchurian Hempen Rope Company which is located at Harbin. This plant is capitalized at one million yen and can produce one million kilograms of hemp rope per year. The Chinese Communist officials denied any knowledge of such a plant. Inasmuch as information concerning the existence of this plant was obtained from sources considered to be reliable, it is assumed that the Chinese Communists have either destroyed it or more likely, have moved it to another location.

### 4. Dyeing Plants

Two of the largest dyeing plants were inspected both capable of processing about 15 million pieces per year.

The Tohawa Dyeing Factory at Mukden had been completely stripped of all its dyeing facilities and electric motors. Only the relatively few looms and two small boilers were left. The Chinese state that the Soviets removed this equipment.

At the Kotoku Dyeing Factory at Mukden it was found that about half of the electric motors had been removed which represents about five per cent of the total equipment. The Chinese state that the motors were removed by the Soviets. Otherwise the plant is intact and appears to be in good condition.

Plant Inspection Reports on most of the above mentioned plants connected with the Textile Industry will be found in Appendix 12.

## D. PRESENT STATUS OF TEXTILE INDUSTRY

Taking the textile industry as a whole it is believed that Manchuria suffered more through the loss of its stockpiles of raw materials and finished products than it did through the removals of equipment. This loss although costly is obviously not as serious as the loss of industrial equipment.

The 400,000 cotton spindles which remain in Manchuria can process about 50,000 tons of cotton per year. Manchuria can produce only about 40,000 tons so that Manchuria will have ample spinning equipment for this amount. Manchuria has always imported raw cotton as well as cotton and cotton piece goods, although the amount of imports has steadily ed with the modernization of its equipment. The effect of the removals may reverse this trend.

The Soviet removal of 90 per cent of the equipment of the Manchurian and Mongolian Woolen Company and the fact that the Kotoku Woolen Weaving Company is in the hands of the Chinese Communists has practically eliminated Manchuria's production of woolen yarn and woolen piece goods. Unless woolen textile equipment is transferred to Manchuria, it will be necessary to rely almost entirely on imports.

There were no reported removals of hemp processing plants other than The Manchurian Hempen Rope Company at Harbin, about which the Chinese Communists professed to be ignorant. This industry must continue to expand since Manchuria has never been able to produce more than 40 per cent of her needs despite favorable conditions for the growing of hemp. It is believed that the hemp processing industry is practically as well off now as at the termination of hostilities.

Manchuria had the capacity to dye about 78 million meters of piece goods. One plant representing about one-fifth of Manchuria's capacity was removed. The need for this plant is, of course, dependent upon the extent to which textile production is restored.

One side light on the present status of the Textile Industry which possibly should be given some consideration was expressed to us by General Yau, Communist Representative at the Truce Team Headquarters in Mukden. He reported that in some areas where the Chinese Communists had taken over, they had removed textile machinery and other facilities for producing consumer goods which were needed for civilian economy in communist areas. While General Yau denied that any aid was being received from the Soviet forces, it may be that some of the removals made during the Soviet occupation were turned over to the Chinese Communists or to the Mongols.

## E. ESTIMATED DOLLAR VALUE OF SOVIET REMOVALS AND DESTRUCTION

Our inspection of cotton spinning plants plus the information furnished by the Northeast Chinese Economic Commission indicates that cotton spinning capacity of Manchuria was reduced by approximately 15 per cent because of Soviet removals or destruction. For the purpose of estimating the dollar value we must assume that a 15 per cent loss of production capacity equals a 15 per cent loss of capital assets.

We also found that the Soviets removed all the inventories even when they made no removals of industrial equipment. The inventory of an industrial plant is usually about 30 per cent of the assets.

As previously stated the total capitalization of the principal cotton spinning plants in Manchuria was taken at 182 million yen. We have estimated above that 45 per cent of the total capitalization was lost and 45 per cent of 182 million is roughly 82 million yen, or $19,300,000 at 4.25 yen to the dollar.

The Manchurian-Mongolian Woolen Company in Mukden had a capitalization of 80 million yen which at 4.25 yen to the dollar would be approximately $18,800,000. The Chinese Government estimates that the dollar value of Soviet removals at this plant was 18 million dollars and inasmuch as our inspection showed that 90 per cent of the industrial equipment had been removed, 18 million dollars is believed to be a correct figure.

Assuming losses in the dyeing, hemp, and other small textile companies to be one million dollars, the total losses in dollar value to the Textile Industry is as follows:

| | |
|---|---|
| Cotton Spinning Plants | $19,000,000 |
| Woolen Plants | 18,000,000 |
| Dyeing, Hemp and other small textile plants | 1,000,000 |
| Total | $38,000,000 |

# CHAPTER XIII

## PAPER AND PULP

### A. BRIEF HISTORY OF THE INDUSTRY

Geographical conditions in Manchuria are favorable to the pulp and paper industry. Wood, which is of course the basic raw material, is readily available from the large forest districts and can be transported cheaply by water or forest railways to transportation centers. Other necessary resources such as hemp, reed stem and soya bean stem are abundant in Manchuria. The pulp and paper industry in Manchuria, however, has only been developed in recent years and its production is still far below its potential capacity.

#### 1. Pulp

The following table lists the principal pulp producers, their capital, location and capacity.

| Company | Capital--MY* (includes Papermaking) | Capacity (MT) | Material Used |
|---|---|---|---|
| Chinchow Pulp Stock Company, Ltd., or Shinseimei Paper Manufacturing Company (Chinchow) | 20,000,000 | 17,000 | reeds |
| Antung Papermaking Company (Tunghua) | 10,250,000 | 18,000 | wood |
| Antung Papermaking Company (Antung) | - | 15,000 | wood |
| Manchuria Pulp Industrial Company (Hailin and Mutanchiang) | 10,000,000 | 18,000 | wood |
| Manchuria Bean-Stem Pulp Company (Kaiyuan) | 30,000,000 | 10,000 (?) | Kraft pulp |
| Kanegafuchi Papermaking Company (Kaishantun) | 15,000,000 | 15,000 | wood |
| Kanegafuchi Papermaking Company (Yinkow) | - | 15,000 | reed |
| Toyo Pulp Company (Tungchingcheng) | 10,000,000 | 18,000 | wood |
| Total | 95,250,000 | 126,000 | |

---

* MY - Manchurian Yuan

The foregoing table shows that the eight principal producers of pulp in Manchuria had a total annual production capacity of 126,000 metric tons (JANIS, Chapter IX, page 366,) and that the total capitalization of these companies was 95 million Yen. However, in 1940 these plants produced only 61,000 tons. In 1943 production had increased to about 67,000 tons, still far below capacity. In fact, under the original Five Year Plan initiated in 1937, Manchuria was to produce 120,000 metric tons of pulp in 1941 and this figure was later revised upward to 400,000 tons.

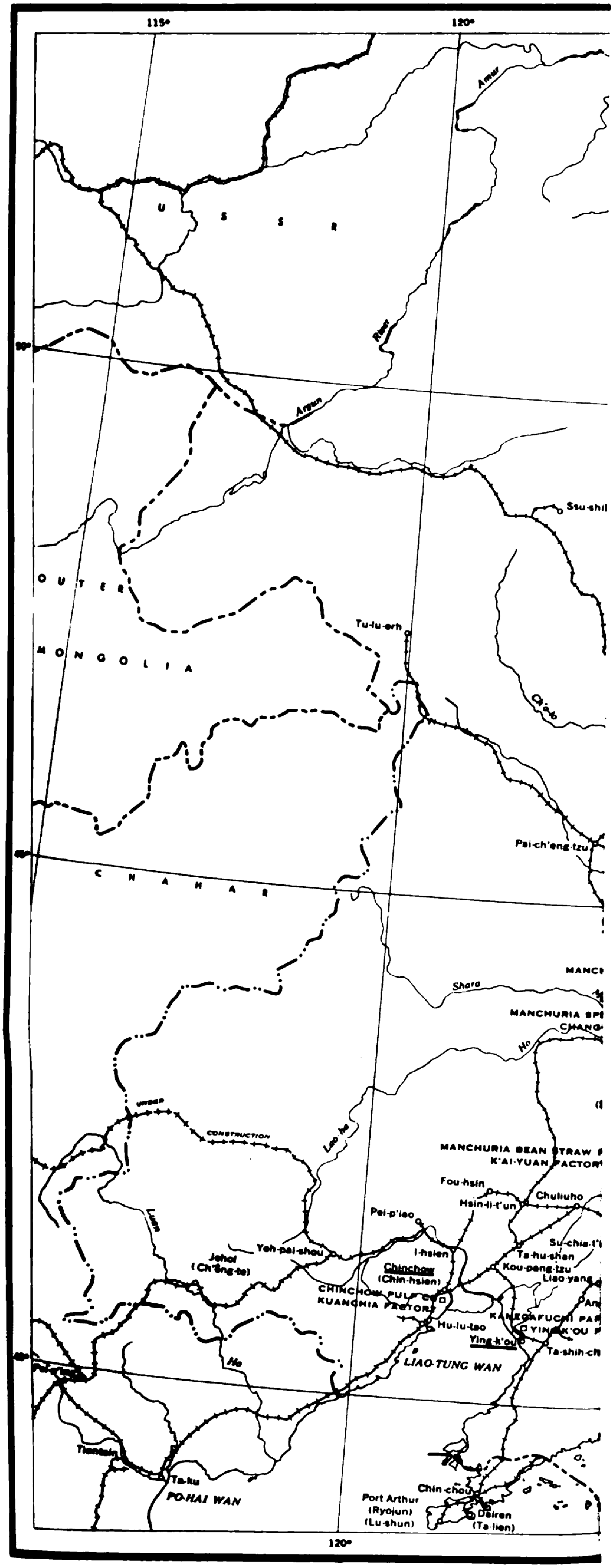
Manchuria has developed a high grade pulp, manufactured from reeds growing on the banks of the Liao, Yalu, and Sungari rivers. The Manchurian Soya Bean Stem Pulp Company also developed a process of manufacturing staple fiber from soya bean stalks.

Removals: Inspection of the Manchuria Soya Bean Stem Pulp Mill at Kaiyuan revealed that all the industrial equipment except the built-in installations had been removed. Pictures were taken of this plant and show clearly that it had been completely stripped. According to the Chinese, the removals were made by the Soviets. This plant had a production capacity of 15,000 metric tons per year. During the war it produced monthly about 450 tons of paper bags and 200 tons of pulp. For additional details see Plant Inspection Report 20-0-1 in Appendix 13.

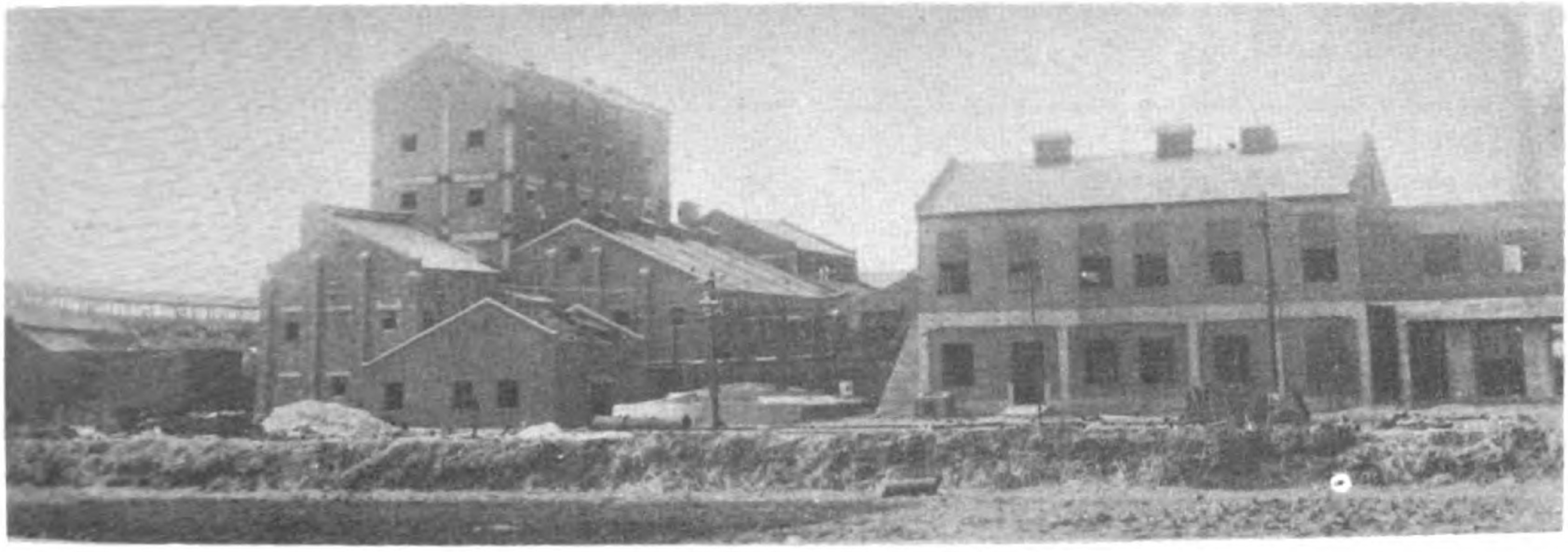
Arrangements with the Chinese Communists to visit the Manchurian Pulp Industrial Company located at Hailin between Harbin and Mutanchiang were unsuccessful. It is believed, however, that this plant was seen from the train and it appeared to be completely wrecked. The area in which this plant is located was the scene of bitter fighting between the Japanese and the Russians. It had a productive capacity of 15,000 metric tons and in 1944 produced 2,693 tons of pulp and 513 tons of paper. See Plant Inspection Report 11-0-3 in Appendix 13 and also Source File 11-D-3.

We inspected the Shinseimei Paper Manufacturing Company at Chinchow which was formerly the Chinchow Pulp Stock Company and is one of the principal pulp plants in addition to being a very large paper manufacturing company. Here the Chinese manager stated that the Soviets took away five carloads of equipment. Inspection disclosed that no heavy machinery was taken, the removals consisting mainly of paper felts, conveyor belts and electric motors. It is not known to what extent these removals affect the pulp capacity of the plant, but it is believed that this plant is handicapped more by the loss of power than the loss of equipment. Source File 23-D-1 contains an inventory of materials removed.

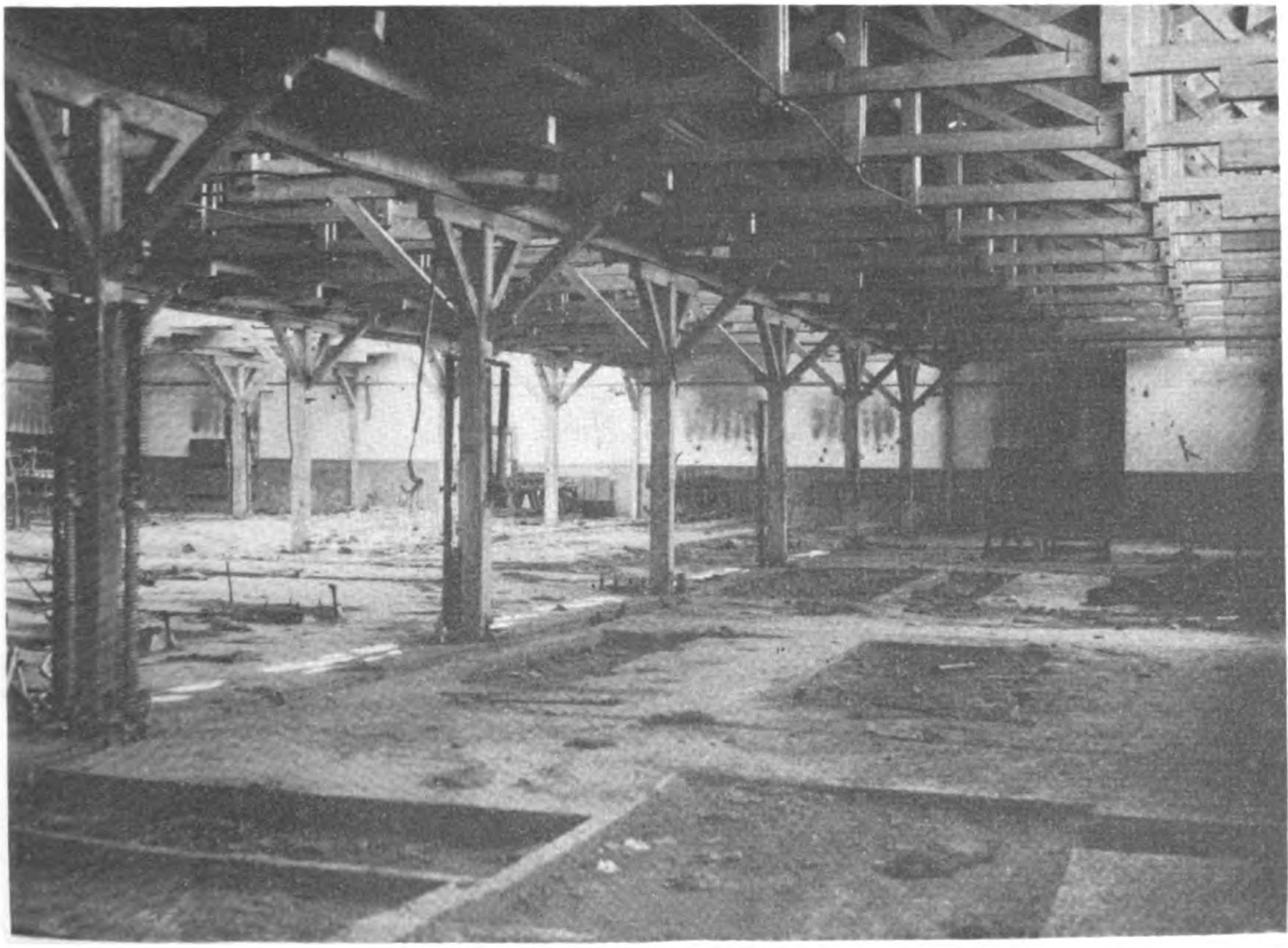
Three of the remaining five principal pulp plants are located at Antung, Tungchingcheng and Kaishantun, now held by the Chinese Communists. No information is available as to whether there were any removals from these three plants.


115°
120°
Amur
U S S R
River
50°
Argun
Ssu-shil
O U T E R
M O N G O L I A
Tu-lu-erh
Ch'o-
Pai-ch'eng-tzu
45°
C H A H A R
MANCH
Shara
MANCHURIA SP
CHANG
Ho
MANCHURIA BEAN STRAW
K'AI-YUAN FACTOR
UNDER
CONSTRUCTION
Lao ha
Fou-hsin
Chuliuho
Hsin-li-t'un
Pei-p'iao
Luan
Su-chia-t'
Ta-hu-shan
Yeh-pai-shou
Jehol
(Ch'êng-te)
I-hsien
Chinchow
(Chin-hsien)
Kou-pang-tzu
Liao-yang
CHINCHOW PULP CO
KUANCHIA FACTORY
An
KANEGAFUCHI PA
Hu-lu-tao
YINGK'OU
Ying-k'ou
Ta-shih-ch
Ho
LIAO-TUNG WAN
40°
Pei-p'ing
Tientsin
Ta-ku
PO-HAI WAN
Chin-chou
Port Arthur
(Ryojun)
(Lu-shun)
Dairen
(Ta-lien)
120°

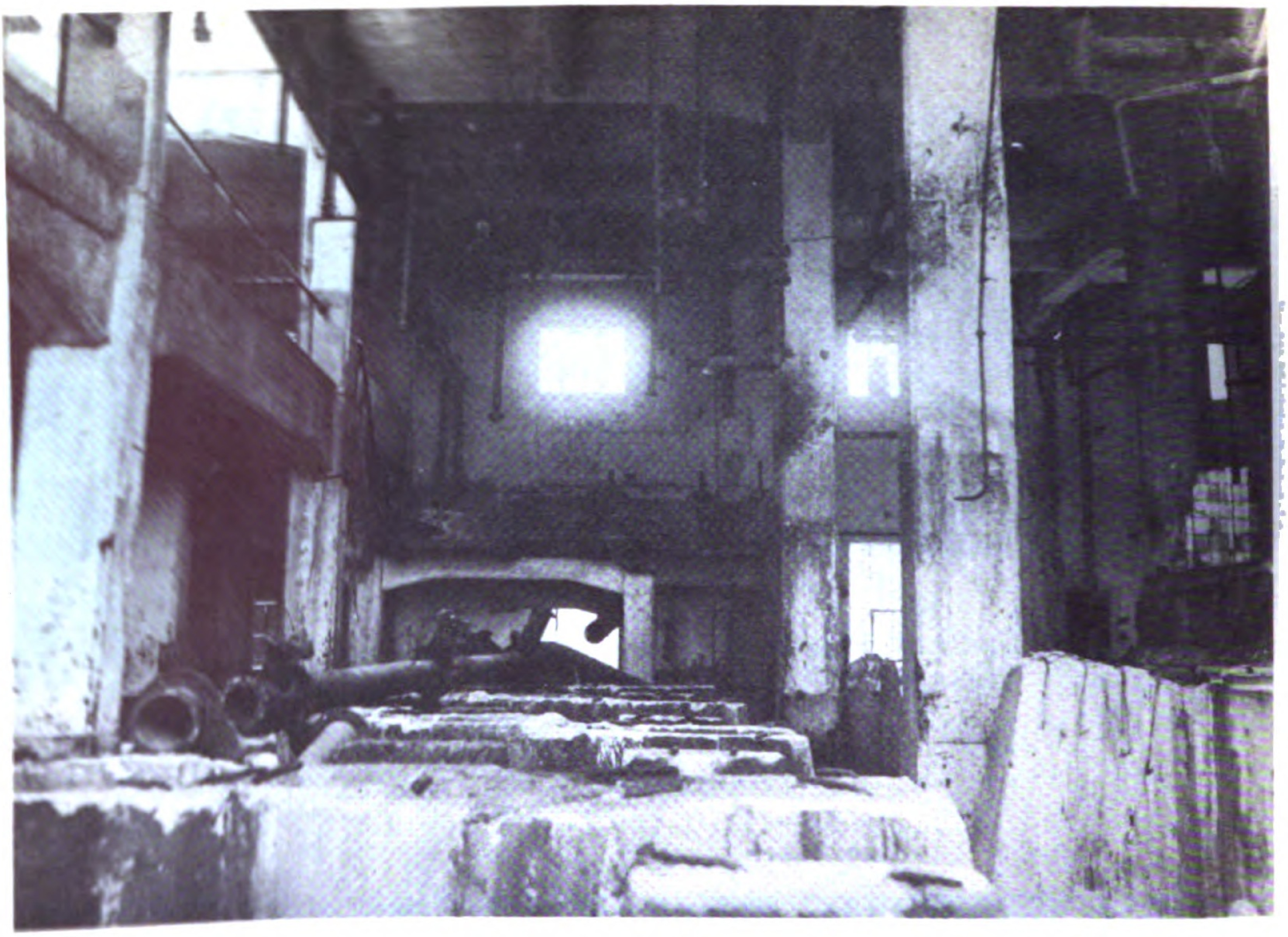
717231 O - 1946 - 252A



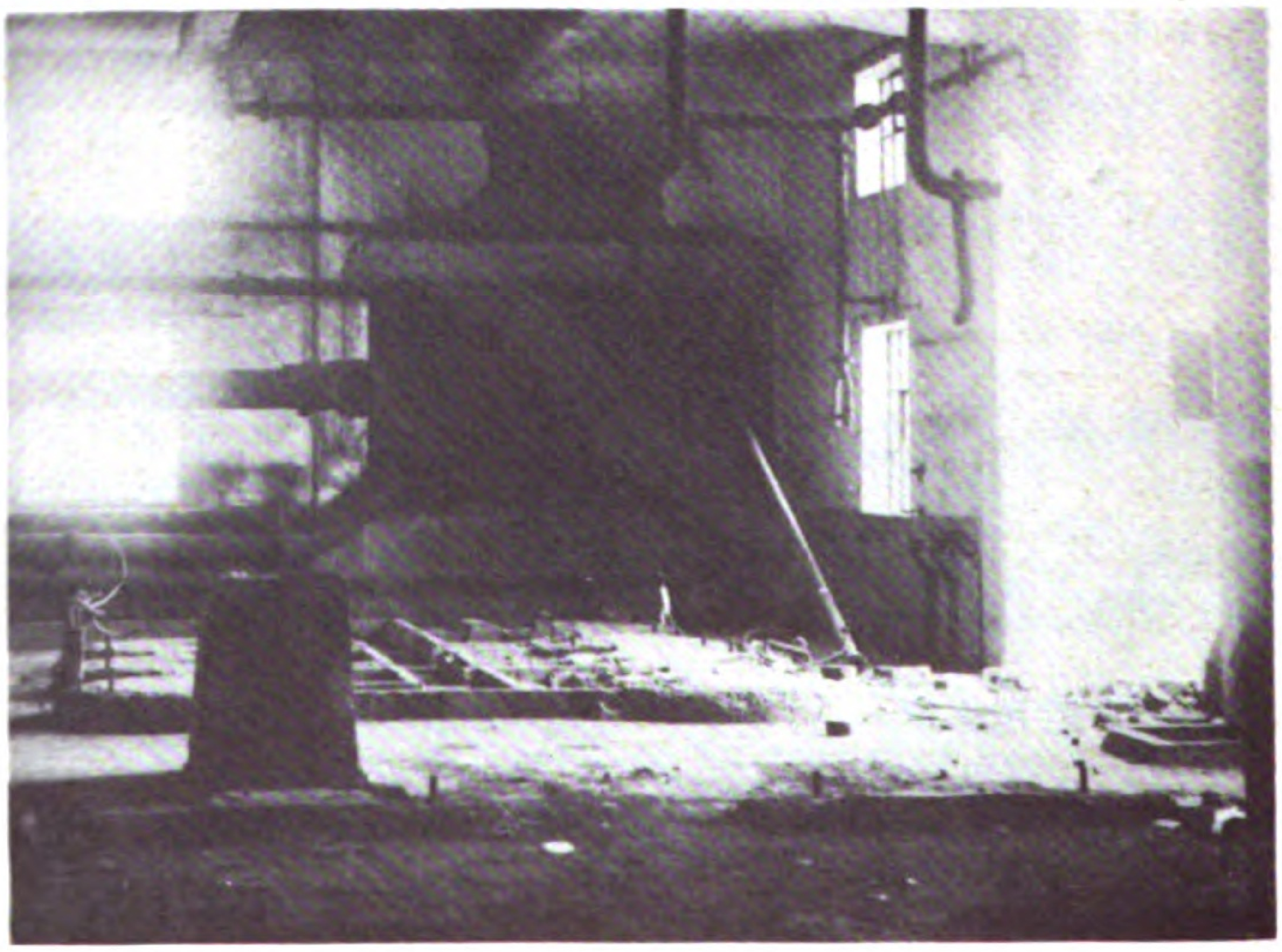
Main buildings of Manchuria Soya Bean Stem Pulp Mill, Kaiyuan. This pulp mill was completely stripped by the Soviets.



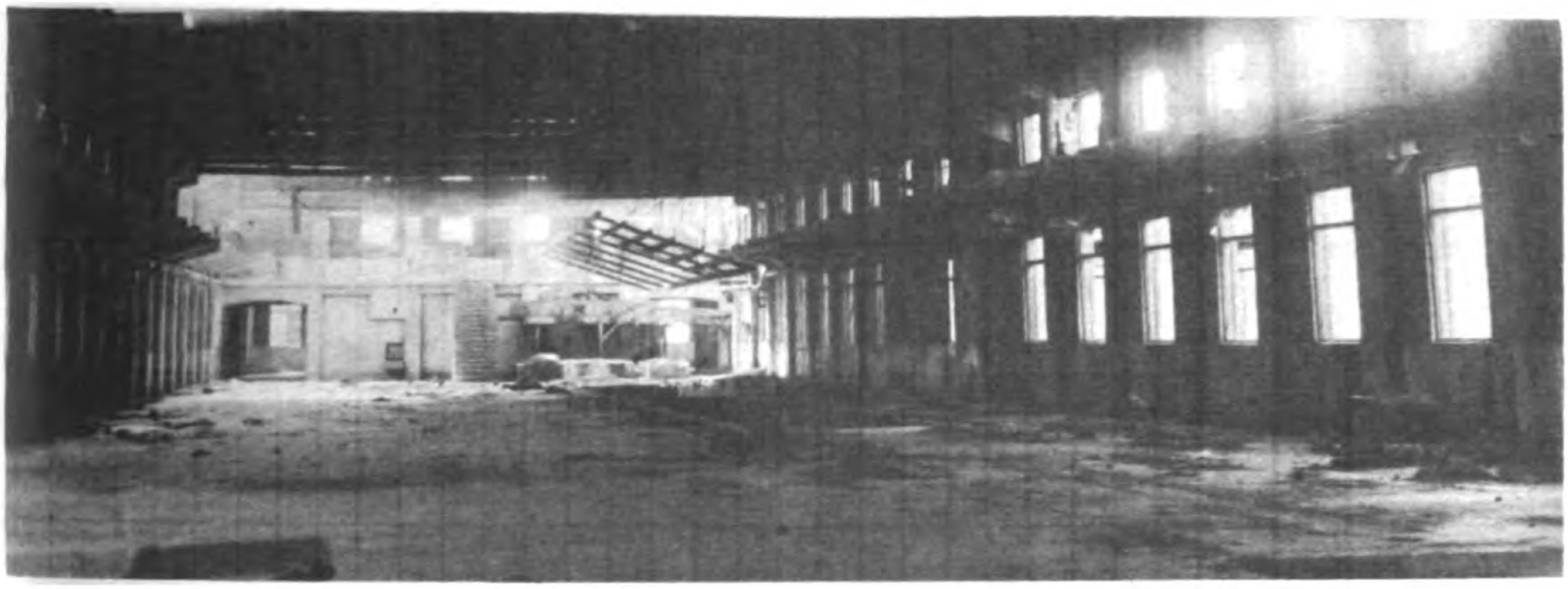
Interior view showing foundations from which pulp mill machinery had been removed during Soviet occupation.



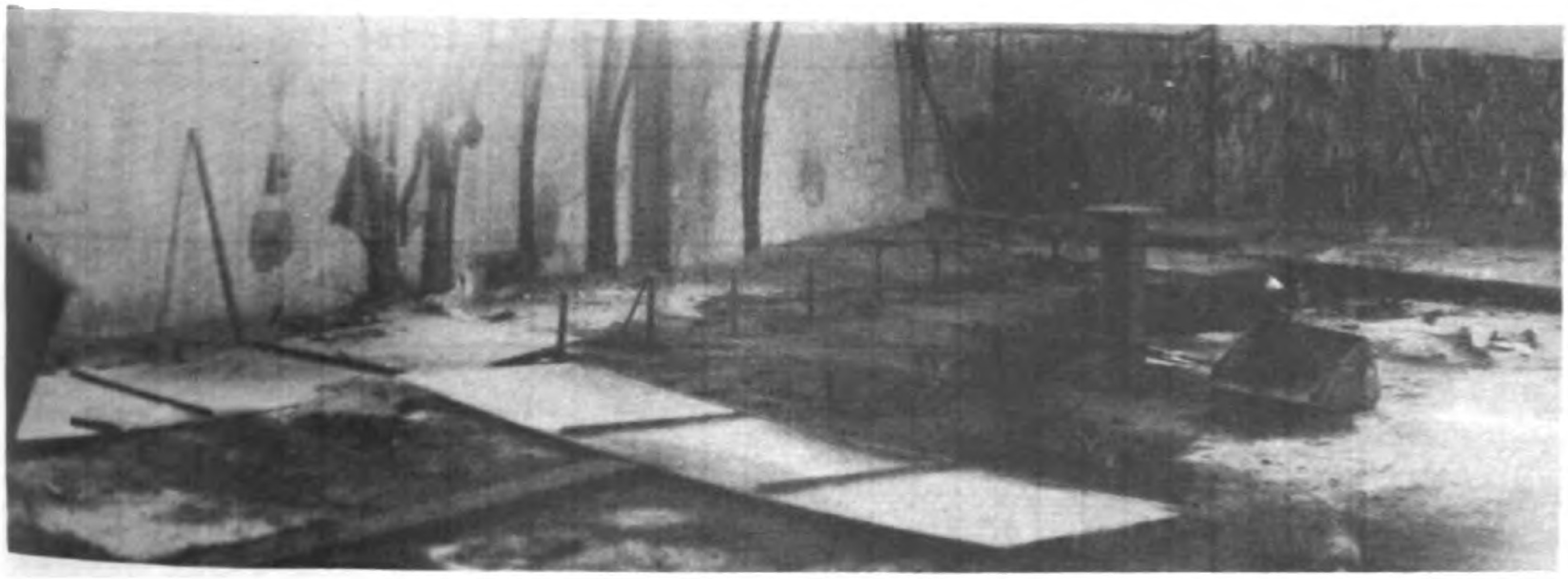
Manchuria Soya Bean Stem Pulp Mill, Kaiyuan. Refining Room from which Soviets removed all equipment.



Dehydration Machine Room after removals.



Manchuria Soya Bean Stem Pulp Mill, Kaiyuan. Dipping and drying room completely stripped of all equipment.



Transformer Room where Soviets removed transformers and distributing panels.

The Chinese report (Source File 201-ZW-1, reproduced in Appendix 2-e) that the Nippon-Manshu Pulp Manufacturing Company at Tunghua had 100 percent of its industrial equipment removed by the Soviets and that the production capacity of the Kanegafuchi Paper Company, Ltd., at Yingkow was reduced 10 percent by Soviet removals.

Although any discussion of the total damage suffered by the pulp industry in Manchuria through Soviet removals is necessarily incomplete since no information is available with respect to three of the eight principal plants, it is apparent from the above summary of removals that the production capacity has been reduced by at least 30 to 40 percent.

## 2. Paper

In the past, Manchuria has secured about 80 percent of her paper through imports, principally from Japan. In 1936, Manchuria consumed about 90,000 tons of paper, 70,000 tons of which were imported. The remaining 20,000 tons were supplied by domestic manufacturers and household industry. Production of paper increased in 1938 to 30,000 tons and in 1940 to 40,000 tons. It reached its peak in 1943 when about 76,000 tons of paper were produced.

At the same time, however, domestic consumption continued to increase so that imports of paper, principally from Japan remained high.

Outside of a very few such companies as the Shinseimei Paper Manufacturing Company in Chinchow, Manchuria's paper industry is carried on by a large number of small companies and household producers. In 1940 they numbered well over one hundred. The majority of these plants are located in territory now held by the Chinese Communists (June-July 1946). Appendix 13-a lists companies which were members of the Manchurian Paper Industry Control Association together with products, capitalization and location of factories.

Removals: Two paper plants were inspected in addition to the Shinseimei Paper Manufacturing Company at Chinchow. One was the Manchurian Special Paper Manufacturing Company at Changchun. This plant was intact. It manufactured reclaimed paper for newspapers and had a capacity of one metric ton daily. The other plant inspected was the Chihua Paper Company at Harbin. This plant was also intact. It produced cermonial paper and had a production capacity of about two metric tons daily.

The Shinseimei Paper Manufacturing Company, already discussed under the Pulp Industry, was said by the Chinese to be the second largest paper company in the Far East, being surpassed only by a Japanese plant. It was built in 1939 and had a capacity of about 25 tons a day and ut 7500 tons per year. Production at present is uncertain because ctric power on which the plant depends. Further, because of

Soviet removal of wire gauze and paper felt, only one machine can be operated at capacity. This plant is now producing about 8 or 9 tons of paper per day.

The Chinese report (Source File 201-ZW-1) that the Soviets removed all the industrial equipment from the Yaluchiang Paper Mill Company, Ltd. at Antung which produced printing paper and had an annual capacity of 3000 tons.

Because of the great number of paper companies, none of which was large, it is not believed that the paper industry suffered much loss in production capacity due to Soviet removals.

## B. PRESENT STATUS OF PULP AND PAPER INDUSTRY

In determining the effect of Soviet occupancy upon the pulp and paper industry of Japan our summary of removals indicates that the Soviets removed between 30 and 40 percent of the industrial equipment from pulp plants. Inasmuch as Manchuria in pre-war years normally exported about 50 percent of her pulp production to Japan, this loss of capacity may not be too serious until such time as Manchuria's production of paper is increased.

There is no information to indicate that the Soviets materially reduced Manchuria's paper production. However, prior to the termination of hostilities, Manchuria was importing from Japan between 60 and 80 percent of her paper requirements.

Manchuria has the natural resources to produce all the pulp and paper she requires. She needs, however, machinery and equipment to utilize her natural resources.

## C. ESTIMATED DOLLAR VALUE OF SOVIET REMOVALS

Sufficient information is not available to estimate the dollar value of Soviet removals in the paper industry. No dollar value figure representing the removal of paper manufacturing equipment is therefore included in our summary computation of losses due to Soviet removals.

As to pulp we have already stated that at least 30 percent of the pulp manufacturing equipment was removed. It is considered reasonable to assume that the equipment removed constituted 30 percent of the capital assets. The table appearing earlier in this chapter shows that the total capital of the eight principal pulp plants is 95 million yen. Based upon 4¼ yen to the dollar the capitalization in dollars would be approximately $22,300,000. The dollar value of removals would accordingly be almost $7,000,000.

# CHAPTER XIV

## LUMBER

The total forest area of Manchuria in 1938 was estimated by the Japanese to be 87,740,000 hectares. Only one-third of this is covered with trees, the balance in moorlands. The volume of standing timber is estimated at 3.7 million cubic meters, of which about 1.5 million cubic meters are coniferous trees and 2.2 million in deciduous trees. Timber is distributed principally in Northern and Eastern Manchuria. Demand has always exceeded available supply.

Manchuria has a large number of sawmills mainly located in the lumber producing areas. The table below shows the number of sawmills in each area, the horsepower of each plant, its capacity in cubic meters, and the number of plants which have equipment of over 200 horsepower. It will readily be seen that many of the mills are very small.

Table O-I

| Location | Number of Mills | Horsepower | Capacity Cubic Meters | Number of mills having equipment over 200 HP |
|---|---|---|---|---|
| Lungchiang | 5 | 717 | 90,300 | 1 |
| Heiho | 2 | 1,817 | 245,400 | 2 |
| Peian | 6 | 1,537 | 203,400 | 5 |
| Pinchiang | 15 | 3,405 | 413,400 | 10 |
| Sanchiang | 17 | 4,110 | 551,900 | 7 |
| Tunganchen | 7 | 1,297 | 186,100 | 3 |
| Mutanchiang | 12 | 3,485 | 430,200 | 3 |
| Chientao | 21 | 3,715 | 488,900 | 9 |
| Kirin | 16 | 3,400 | 467,500 | 9 |
| Tunghua | 5 | 780 | 140,800 | 1 |
| Changchun | 9 | 1,899 | 225,500 | 5 |
| Mukden | 21 | 3,368 | 393,200 | 8 |
| Antung | 1 | 200 | 25,000 | 1 |
| Chinchow | 1 | 53 | 7,200 | 0 |
| Hsingan | 4 | 479 | 54,000 | 2 |
| Total | 142 | 30,262 | 3,922,800 | 66 |

Only 47 of the 142 mills described in the above table are located in territory held by the Chinese Nationalists, July 1946, and of these 47 only 22 have over 200 horsepower.

Table O-II, which is set forth below, gives the name, location, capacity, and planned production in 1945 for the four principal veneer factories.

Table O-II

| Location | Factory | Capacity 1000 pcs. | Quantity Planned | Special | Ordinary |
|---|---|---|---|---|---|
| Pinchiang | Harbin Veneer Factory | 14,400 | 11,700 | 1,800 | 9,900 |
| Kirin | Manchurian Veneer Factory | 18,000 | 10,200 | 3,200 | 7,000 |
| Changchun | Institute of Scientific Research, Manchuria | 2,700 | 1,800 | 540 | 1,260 |
| Dairen | Manchurian Veneer Mfg. Co. | 10,800 | 5,760 | - | 5,760 |
| Total | | 45,900 | 29,460 | 5,540 | 23,920 |

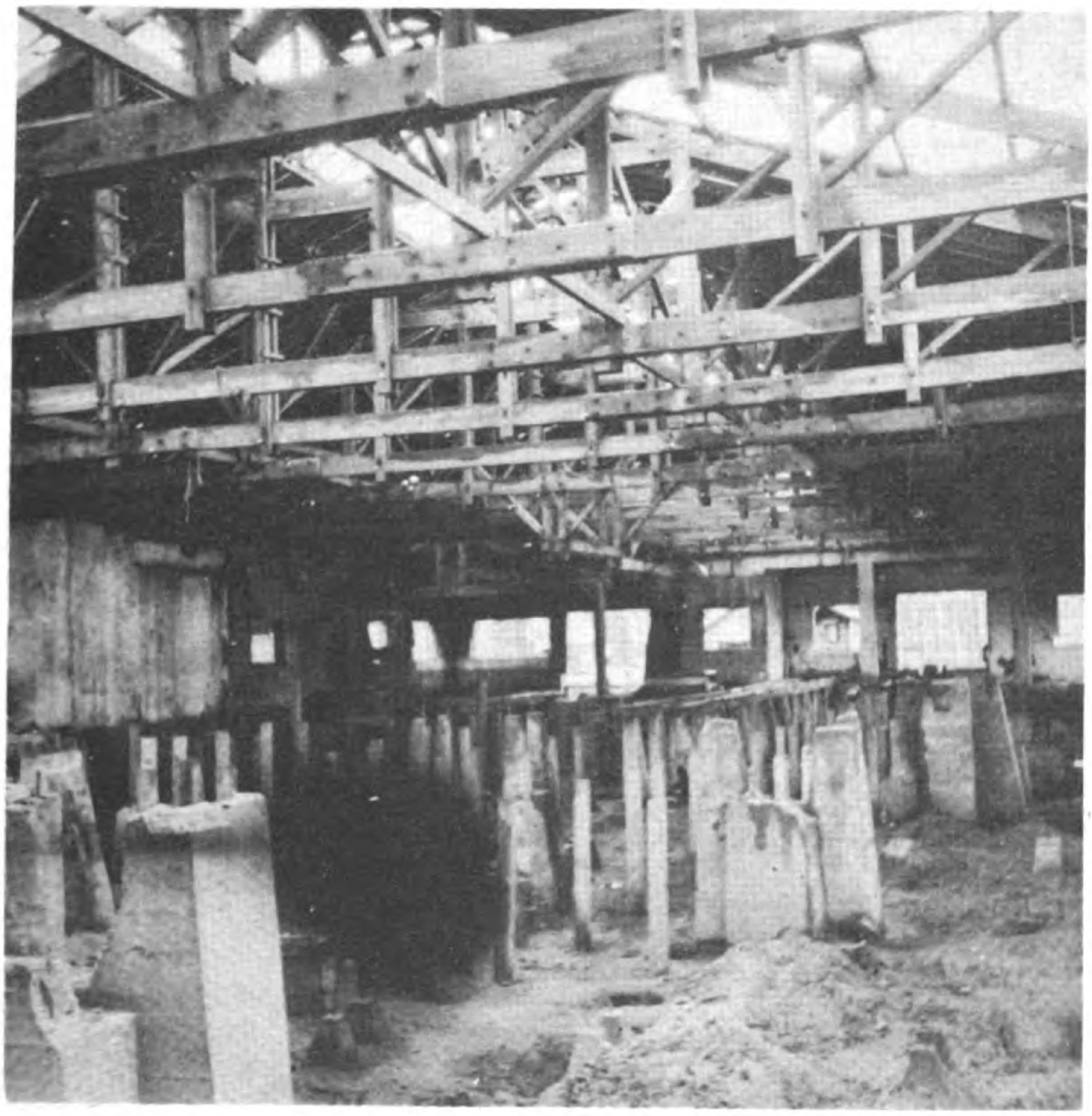
Information for the preceding two tables was obtained from the Japanese "Economical Review of the Northeastern District of China", Source File 302-Y.1-1, and it is believed to be fairly accurate.

## Removals:

Due to the small size of the sawmills and the fact that two-thirds were located in Chinese Communist territory, our inspection of these sawmills was limited to two at Kirin.

We found the Mugen Lumber Company at Kirin to be completely stripped of all equipment and the building badly wrecked. At the time hostilities terminated on August 15, 1945, this plant had a capacity of 36,000 cubic meters. To restore production would mean completely re-building and re-equipping the plant. The plant manager reports that the Soviets removed the industrial equipment and later the buildings were wrecked by unknown persons who were apparently seeking firewood. (Plant Inspection Report 9-O-2 in Appendix 14).

The Kirin Lumber Development Company was also inspected and it was again found that the Soviets had removed all the industrial equipment and that the buildings were subsequently destroyed by the local populace.



Kirin Lumber Co., Kirin

The Soviets removed all the machinery from the plant and the local populace removed the flooring.

This plant was producing about 39,600 cubic meters of lumber per year. For additional details, see Plant Inspection Report 9-0-1 in Appendix 14 and also Source File 9-0-1.

It was learned (Source File 304-X-1) that in the Kirin area the Soviets also removed 90 percent of the equipment from the Manchuria Forest Products Company, Ltd., which produced Japanese wooden shoes in addition to about 6,000 cubic meters of lumber annually.

In the Changchun area it was reported that the Soviets removed 70 percent of the industrial equipment of two sawmills, namely the Sumiyoshi Industrial Company with a capacity of 40,000 cubic meters and the Omotaka Saw Mill which produced 1800 cubic meters of lumber annually. Due to these removals neither of these two plants is able to operate. From the Daini Shokai, a sawmill which produced about 30,000 cubic meters of lumber per year, the Soviets removed 100 percent of the equipment (Source File 303-X-2).

Present Status of Lumber Industry:

Inasmuch as the large part of Manchuria's forests and lumber companies are located in territory now held by the Chinese Communists, it is not feasible to determine the extent of damage due to Soviet occupancy. The fact that much of the industry is composed of relatively small units may have limited the damage.

On the other hand, based upon the high percentage of removals from the two plants which we visited and the four plants on which reports were made by the Chinese, it would appear reasonable to assume that sawmill equipment was urgently desired by the Soviets. If this assumption is correct and the Soviets followed the same pattern of removals of which we saw evidence in Kirin, the lumber industry will have suffered extremely heavy damage. No accurate appraisal of the value of Soviet removals in this industry is possible.

# CHAPTER XV

# RADIO, TELEPHONE AND TELEGRAPH

## A. BRIEF HISTORY

Radio, telephone and telegraph services in Manchuria can be placed in five categories, namely, military, official, railroad, aviation, and public. The preponderance of facilities are represented by the public service, with which this report is concerned. The development of a modern public communications system in Manchuria began with the incorporation in 1933 of the Manchuria Telephone and Telegraph Company, Ltd. This corporation, which had an authorized capital of 50 million yen, was given full control over all public communication facilities.

### 1. Telegraph

In 1933 there were 363 telegraph offices in Manchuria. Charges for telegrams varied in different sections of the country and due to the difficulty of sending them from one area to another, the utilization of telegraphic service was very limited.

With the introduction of an integrated system under the Manchuria Telephone and Telegraph Company the various administrative difficulties which had handicapped telegraphic service were eliminated. The improvement in service is reflected in the increase in the number of telegraph offices and in the number of telegrams transmitted.

By March 1944 there were 1200 telegraph offices in operation or three times as many as there were in 1933. The table below shows the volume of traffic in 1944.

NUMBER OF TELEGRAMS HANDLED BY PRINCIPAL CITIES - 1944

| City | Sent | Received | Transit | Total |
|---|---|---|---|---|
| Changchun | 1,823,388 | 1,823,388 | 2,141,880 | 5,788,656 |
| Mukden | 1,258,188 | 1,258,188 | 5,838,756 | 8,355,132 |
| Dairen | 1,066,188 | 1,066,188 | 1,304,400 | 3,436,776 |
| Harbin | 909,036 | 909,036 | 2,175,048 | 3,993,120 |
| Others | 8,893,994 | 8,893,994 | 6,528,399 | 24,316,387 |
| Total | 13,950,794 | 13,950,794 | 17,988,483 | 45,890,071 |

Sixty per cent of the telegrams transmitted were to points within Manchuria, 30 per cent were to Japan, and 10 per cent to China. In addition, in 1944 there were about 100,000 telegrams sent to countries other than Japan or China.

The classification of messages into three groups, namely, the military, the government, and the public, is shown below.

NUMBER OF TRANSMITTED TELEGRAPH MESSAGES CLASSIFIED
BY USERS- (1944)

| | |
|---|---|
| Public | 12,918,437 |
| Military | 279,015 |
| Government | 753,342 |
| Total | 13,950,794 |

2. Telephone

In 1934 the number of subscribers to telephone service numbered about 30,000. Inasmuch as there was no unified telephone system at that time, there were no uniform rates and due to differences in equipment, telephone service between cities was meager. By March 1944 the number of telephone subscribers had increased to 130,000. At the same time, there were a total of 500 telephone exchange offices. The following table shows the number of telephone subscribers in the four large cities of Manchuria broken down into three classes.

CATEGORIES OF SUBSCRIBERS IN FOUR LARGE CITIES IN 1944

| City | First Class No. of Sub. | % | 2nd Class No. Sub. | % | 3rd Class No. Sub. | % | Total No. of Sub. |
|---|---|---|---|---|---|---|---|
| Dairen | 3,638 | 20 | 5,457 | 30 | 9,095 | 50 | 18,190 |
| Mukden | 3,990 | 23 | 8,153 | 47 | 5,204 | 30 | 17,347 |
| Changchun | 1,801 | 15 | 6,604 | 55 | 3,603 | 30 | 12,008 |
| Harbin | 1,380 | 18 | 3,723 | 52 | 2,569 | 40 | 7,672 |
| Total | 10,809 | 19 | 23,937 | 43 | 20,471 | 38 | 55,217 |

NOTE:

| | |
|---|---|
| 1st Class | Military, Government, and industries of special importance. |
| 2nd Class | Industries of next importance and residences of people engaged in important business. |
| 3rd Class | Others |

During this period considerable progress was made in establishing telephonic communication with countries other than Manchuria. Construction was begun in 1937 on the laying of a direct unloaded cable between Japan and Manchuria which was completed in 1941. This cable also permitted direct service with Korea.

### 3. Radio

In 1933 there were 5,800 registered radio receivers and 4 broadcasting stations, located at Dairen, Mukden, Changchun and Harbin respectively.

The first step undertaken by the Manchuria Telephone and Telegraph Company was to build a modern high-powered broadcasting station at Changchun. New radio stations were rapidly built and existing stations made more powerful. By 1945 the number of radio stations had been increased to 21.

In 1937 the sale of cheap but efficient radio receivers was begun and by April 1, 1944 there were a total of 564,000 registered listeners.

There were three categories of broadcasts: one, those for overseas consumption; two, Japanese language conducting programs; and three, domestic programs in Chinese, and in some localities, Russian or Mongolian.

## B. GEOGRAPHICAL LOCATION OF SERVICES

Telegraph facilities were available to almost all communities in South and Central Manchuria particularly where there was any industrial development. In other sections telegraph lines and offices for the most part were along the railroads. Two submarine cables were reported as leading to Japan and a third to Yentai (Chefoo), China. All three cables had their Manchurian terminus at Dairen. Telephone communications paralleled telegraph lines except that they did not extend to outlying areas but of course were more intensive in the cities and concentrated industrial sections.

There was fairly good radiotelephone and radiotelegraph communication with South and Central Manchuria but to the east and particularly to the undeveloped areas north, were few facilities. Both Changchun and Dairen each had a radio broadcasting station of over 10,000 watts and from an overall communications standpoint, these two cities were the largest centers with Mukden being next in importance and Harbin ranking fourth.

## C. INSTALLATIONS INSPECTED BY PAULEY MISSION

Inspections were made of telephone, telegraph and radio facilities in the Changchun area, which formed the center of communication channels in Manchuria and at the same time was the administrative headquarters for the Manchuria Telephone & Telegraph Company. Apart from this nerve center of communications, and a similar but smaller establishment at Dairen which the Soviet authorities prevented the Mission from visiting, facilities are distributed primarily throughout the industrialized areas of Manchuria in small units. The decentralized nature of the installations did not permit the Mission to inspect a large percentage of the industry.

A sizeable radio manufacturing plant which had been completely stripped of all equipment reportedly by the Soviets was inspected by the Pauley Mission in Changchun.

## D. CAPACITY LOSS DUE TO SOVIET REMOVALS

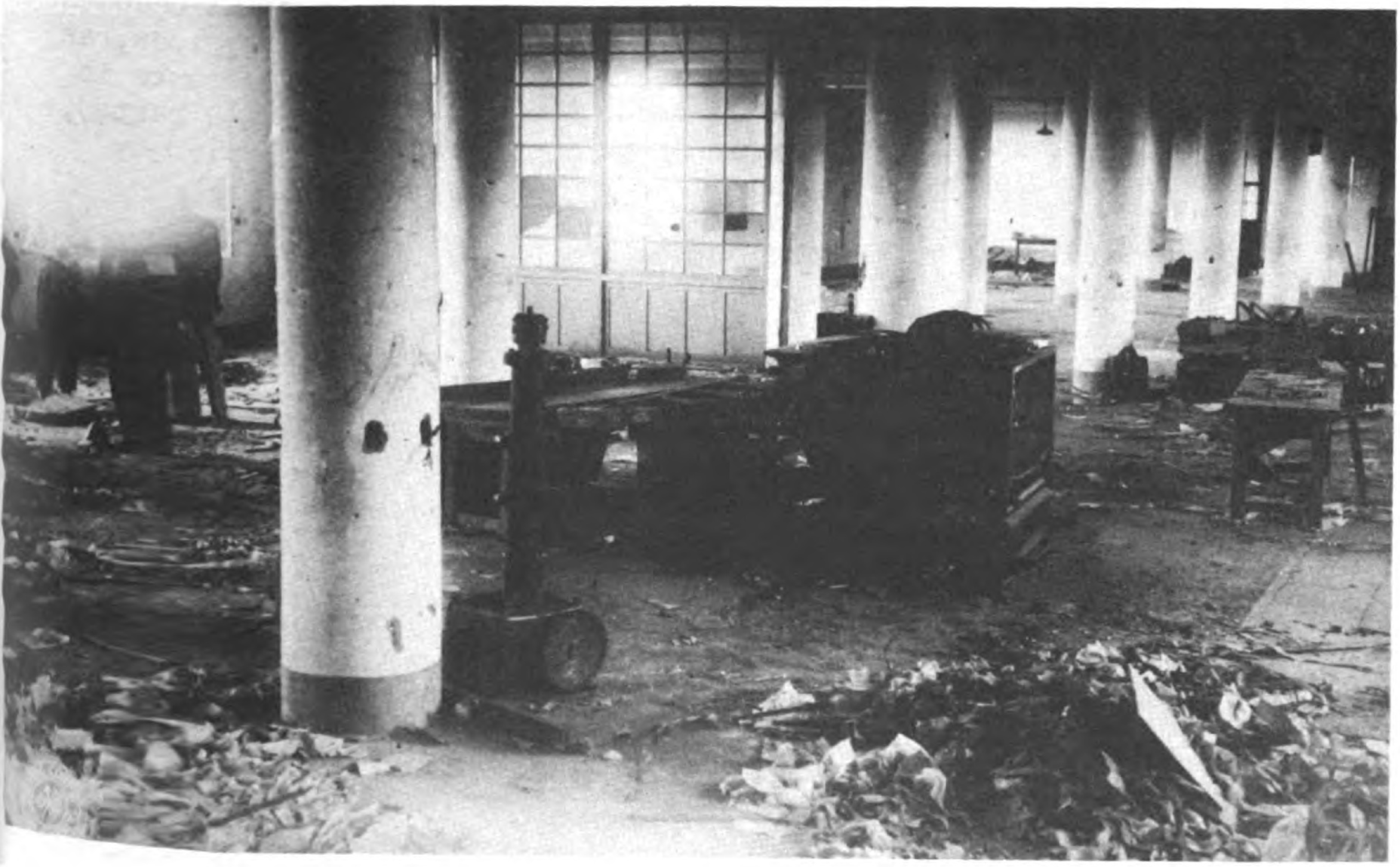
Again, because of the decentralized nature of the industry, complete records as to removals and existing conditions have not been compiled. Records for Changchun and Mukden were available and the pattern established in those two cities can probably be considered characteristic of removals throughout Manchuria. Listing major equipment removals becomes lengthy when applied to the telephone, telegraph, and radio services, as installations are an integration of small electric units. Reference is made to detailed listing of removals under Source Files 8-R-1 (4 parts), 303-R-1, 303-R-2, and 201-X-11, which were supplied to the Mission by both Chinese and Japanese sources.

Japanese officials of the Manchuria Telephone and Telegraph Company prepared an extensive report for the Mission (Source File 303-R-2) wherein Soviet removals are estimated. This information was gathered in Nationalist areas directly by existing Chinese company staff and Japanese who still remain. From areas under Chinese Communist and Soviet control information was supplied by Japanese entering Changchun from these outlying districts. The following estimates were found to be reliable where the Mission was able to check them, and the estimates for removals throughout Manchuria are considered to be reliable.

| | | | | |
|---|---|---|---|---|
| Telephone lines | 20% | Removal | and | Damage |
| Telephone installations (exchange boards, subscribers sets, etc.) | 50% | " | " | " |
| Telegraph installations | 50% | " | " | " |
| Carrier telephone installations for long distance communications | 50% | " | " | " |
| Broadcasting installations | 90% | " | " | " |
| Laboratory installations | 100% | " | " | " |
| Equipment manufacturing installations | 90% | " | " | " |

## E. CAPITALIZATION OF THE SERVICES AND ESTIMATED VALUE OF LOSSES

The Manchuria Telephone and Telegraph Company was founded in August 1933 and was capitalized for 50,000,000 ¥. The capital was later increased



**RADIO MANUFACTURING PLANT, CHANGCHUN** - Plant stripped by Soviets of radio manufacturing machinery and equipment.

to 200,000,000 ¥, which is presumed to have been paid up. Assuming that about 60 per cent of the company's facilities were removed, a rough estimate of the value of these removals totals 25,000,000 US dollars. No estimate is being made for removals of military, official, railway or aviation facilities because of their military nature.

# CHAPTER XVI

## PRECIOUS METALS, CURRENCY AND SECURITIES

According to the laws of Manchukuo the Central Bank of Manchukuo was the only bank allowed to keep precious metals. Without a special investigation devoted entirely to the problem it is impossible to state the extent to which this law might have been evaded. It is likewise difficult to state whether the amount of gold and platinum reported to the mission as having been held by the bank at the time of Soviet entry represents the complete amount held just prior to the announcement of surrender. It is reasonable to believe that some might have been hidden between the end of the war and the arrival of the Soviets and back entries made to cover it.

From a former Japanese director of the Central Bank of Manchukuo and manager of the Changchun Branch of the Yokohama Specie Bank who was in Changchun at the time of the Pauley Mission Inspections, we were able to obtain a good deal of information on precious metals, currency and securities in Manchuria prior to and during the Soviet occupation. This information is considered to be the most reliable obtained and is drawn upon for this report. For additional details see Source File 303-Y.1-2.

At Changchun, the banking center of Manchukuo, and presumably at Mukden, the Soviets took over the banks immediately on their arrival and evicted the Japanese. Our source stated he attempted to get a receipt from the Soviets for the bank assets but was unsuccessful. His record of precious metals on hand by the Central Bank is as follows:

Gold: 36,212 grams in the safe of the Central Bank of Manchukuo at Changchun.

2,074,075 grams at the Mukden Branch of the Central Bank.

Platinum: 32,000 grams in the safe of the Central Bank of Manchukuo at Changchun.

Silver: No record.

According to these figures the Soviets obtained from this source 2,110,287 grams of gold and 32,000 grams of platinum having an approximate value in U. S. currency of $2,142,000.

Information furnished by the ex-staff of the Mukden Branch of the Central Bank of Manchukuo indicates a larger amount of gold. They state the gold on hand at Mukden was approximately 3.5 metric tons (3,500,000 grams—approximately $3,500,000).

Currency held by Manchukuo banks and confiscated by the Soviets, according to our first source was as follows:

Banks Managed by Japanese

| | | |
|---|---|---|
| The Central Bank of Manchukuo | (MY)* | 509,000,000 |
| The Industrial Bank of Manchukuo | | 5,000,000 |
| The Yokohama Specie Bank (Including Foreign Currency of 1,100,000 yen value) | | 18,000,000 |
| The Bank for Farm Promotion (Kono Kinko) | | 2,570,000 |
| The Commercial and Industrial Association (Shoko Kinyu Gassakusha) | | 15,500,000 |
| The Bank of Teito | | 11,800,000 |
| TOTAL | (MY) | 561,870,000 |

Banks Managed by Chinese

| | | |
|---|---|---|
| The Bank of Ekihatsu | (MY) | 27,660,000 |
| The Bank of Kose | | 650,000 |
| The Bank of Harbin | | 250,000 |
| The Bank of Shijo | | 290,000 |
| The Commercial and Industrial Bank of Fengtien | | 100,000 |
| Bank of China | | 210,000 |
| TOTAL | (MY) | 29,160,000 |
| TOTAL Reported Seized by Soviets | (MY) | 591,030,000 |

The Chinese managed banks according to the first source suffered additional losses from the Chinese Communist army—the Japanese banks having ceased to exist after the Soviet occupation. Their losses were reported as follows:

| | | |
|---|---|---|
| The Bank of Ekihatsu | (MY) | 1,090,000 |
| The Bank of Kose | | 890,000 |
| The Bank of Changchun | | 970,000 |
| The Bank of Koo | | 360,000 |
| The Bank of Communication | | 3,000,000 |
| The Bank of China | | 7,000,000 |
| TOTAL | (MY) | 13,310,000 |

---

* (MY) - Manchukuo Yuan

The Central Bank of Manchukuo was the only bank which operated safe deposit boxes. Except for the following two items reported as confiscated by the Soviets, records of the contents are not available:

| | | |
|---|---|---|
| The Yokohama Specie Bank (including ¥ 500,000 cash) | (MY) | 770,000 |
| The Industrial Bank of Manchukuo (mostly valuable securities) | | 5,000,000 |
| TOTAL | (MY) | 5,770,000 |

Negotiable securities held by the various Japanese banks and reported as having been confiscated by the Soviets are as follows:

| | | |
|---|---|---|
| The Yokohama Specie Bank | (MY) | 10,050,000 |
| The Industrial Bank of Manchukuo | | 1,400,000,000 |
| The Bank of Teito | | 265,000 |
| The Commercial and Industrial Assn. Bank (Shoko Kinyu Gassakusha) | | 7,935,000 |
| *The Central Bank of Manchukuo | | 4,247,110,000 |
| TOTAL | (MY) | 5,665,360,000 |

*This amount said to be underestimated.

Practically all of these securities are presumed to be shares and bonds of Japanese Corporations.

Of a related nature, it was reported that the Soviets removed supplies and materials, such as currency printing paper, and printing equipment valued at about 25,430,000 Yuan from the Printing Office of the Manchukuo Government at Changchun. These were taken during two periods, the first of which, in September 1945, the Soviets removed only selected items of equipment and all the printing paper. During the second period in April 1946, the Soviets made major removals and damaged the building and the few pieces of remaining equipment. See Source File 303-X-3 for details and pictures in Chapter II.

The currency removed from Manchurian banks by the Soviet authorities was reported to have been used to make purchases of goods in Manchuria either by the Soviet army for export to the U.S.S.R. or by individual soldiers who were hungry for consumer goods of any kind. The amount of currency taken from the banks, however, is a small item compared with the estimated issuance of occupation notes in the amount of 9,700,000,000 yuan. In order to evaluate the drain on the Manchurian economy, which has resulted from the issuance of this money, it would have to be determined what was purchased with the money and removed from the economy in the form of goods or services. Such a determination, of course, cannot even be estimated. Evidence of the use of occupation currency to purchase the securities of the large mercantile firm I. I. Tschurin & Company, Ltd., is related in page 5 of Appendix 2b.

Prior to the Japanese surrender, the yuan was pegged to the Japanese yen, which was fixed by Japanese exchange regulations at about 4.26 yen to the U. S. dollar. The majority of the paper yuan which were in circulation at the time of the Mission's visit to Manchuria were Soviet issues which were sold interchangeably with old Manchukuo and new Chinese Nationalist Manchurian Yuan by many money changers on the streets at rates varying from 250 to 350 to the dollar. The exchange rates reflect little significance of purchasing value however, but merely reflect the relative confidence of the populace in the two currencies.

The securities which were removed from the banks by the Soviet authorities for the most part would have become valueless by the vesting by Allied authorities of Japanese physical assets in Manchuria and by the operation of military occupation of Japan. The damage done to Japanese assets in Manchuria has been appraised in this report on the basis of physical assets and probably no additional value could be added logically for any securities representing ownership or liens on these physical assets. However, Soviet interests may at some future time present these securities as evidence of ownership of enterprises in Manchuria and the manner in which they were acquired may become of importance.

# CHAPTER XVII

## RECORDS AND FILES

The Source Files of the Pauley Mission contain publications, reports and other papers which were consulted during the preparation of the report. In the United States data were secured from various branches and agencies of the U. S. Government. In Tokyo data were obtained from various sections of General MacArthur's Headquarters and from Japanese who were important executives in the control of industries operating in Manchuria. In Manchuria, similar material was obtained from United States and Chinese Government agencies and from individuals, American, Chinese, Japanese and Soviets, who were interviewed on the spot. Included also are notes of members of the Mission made during plant inspections in Manchuria. All classified material prepared by agencies other than actual members of the Pauley Mission can be made available only by the originating agencies.

The files have been indexed according to the following plan:

Number - Letter - Number

The first number refers to the source, the letter to the subject, and the final number, to the numerical position in the series assigned to the document. In detail the plan is as follows:

Source Number

| Series 0-99 | Originated by Pauley Mission |
|---|---|
| 1 | Mukden, Fushun Area |
| 2 | Liaoyang, Penchihu Area |
| 6 | Chinhsi, Hulutao Area |
| 7 | Hailung Area |
| 8 | Changchun Area |
| 9 | Kirin, Tafengmen Area |
| 10 | Shulan Area (NE of Kirin) |
| 11 | Harbin Area |
| 13 | Mutanchiang Area |
| 19 | Ssupingchieh Area |
| 20 | Kaiyuan Area |
| 21 | Fouhsin Area |
| 22 | Peipiao Area |
| 23 | Chinchow Area |
| 28 | Hsian Area |

| Series 100-199 | U. S. Source Information |
|---|---|
| 101 | JANIS (Joint Army-Navy Intelligence Study) |
| 102 | SCAP (Supreme Commander Allied Powers) |
| 103 | General George Marshall |

| | |
|---|---|
| 104 | Department of Interior |
| 105 | Foreign Economic Administration |
| 106 | Strategic Service Unit - China Theatre |
| 107 | U. S. Civilian Sources |
| 108 | U. S. 14th Air Force Photo Int. Detachment |
| 109 | Board of Economic Warfare |
| 110 | Army Map Service |
| 113 | Office of Strategic Services |
| 114 | Military Intelligence Service, War Department |
| 115 | Office of Economic Security Policy (State Department) |
| 116 | Department of State |
| 117 | War Department |
| 119 | U. S. Consular Sources |

| Series 200-299 | Chinese Source Information |
|---|---|
| 201 and | Northeastern Economic Commission, |
| 202 | Ministry of Economic Affairs |

| Series 300-399 | Japanese Source Information |
|---|---|
| 301 | Miscellaneous Japanese Sources |
| 302 | Material prepared by Japanese under the direction of a former official of the Manchurian Heavy Industries Company, Ltd. |
| 303 | Japanese—Manchuria |
| 304 | Japanese—North China |
| 305 | Japanese—Tokyo |

The letter designation refers to subjects as follows:

| | |
|---|---|
| A | Iron and Steel |
| B | Mines and Smelters (including coal) |
| C | Chemical Industries |
| D | Pulp and Paper |
| E | Synthetic Fuels |
| F | Shipbuilding |
| G | Light Metals |
| H | Cement |
| I | Petroleum and Oil Shale |
| INT | U. S. Intelligence Reports |
| J | Machinery and Metal Working |
| K | Textiles |
| L | Electric Power |
| M | Docks and Harbors |
| N | Railroads |
| NR.2 | Food |
| NR.3 | Beer |
| NR.4 | Tobacco |
| O | Lumber |

| | |
|---|---|
| P | Research Institutes |
| Q | Arsenals |
| R | Radio, Telegraph, and Telephone |
| U | Maps |
| V | Gazetters |
| W | Index |
| X | General Industries |
| Y | Political Reports |
| Y.1 | Economic Reports |
| Z | Historical |
| ZZ | Recent Historical |

Copies of individual plant inspection reports are included in the Appendices. Additional information including flow sheets, plans of plant layouts, statistical data, notes on removals where obtainable is available in the file series 1 to 28 and for convenience are listed as Source Files with the same number as the Plant Inspection Reports. They are located in the Mission's files.

The U. S. Source File (Series 101-119) contains in addition to reference material which predates the Pauley Mission, the various reports obtained in Manchuria from and through the U. S. Strategic Service Unit. In addition to documents originated by the unit, there are reports from residents of Manchuria which were obtained on behalf of the Mission.

Information in the Chinese Source file (Series 201-202) originated entirely with the Northeastern Economic Commission, Ministry of Economic Affairs. It is material gathered largely from Japanese sources obtained both on their own initiative and at the request of the Mission. Inventories of Soviet removals as prepared by the Japanese are included in this file.

The Japanese source material (Source Files 301-305) with the exception of a few reports, was prepared at the request of the Pauley Mission. Of particular interest is the very comprehensive series of tabulations entitled "Economical Review of the North-Eastern District of China". This was obtained through the assistance of the SSU from a former Japanese official of the Manchurian Heavy Industries Company.

The following is a detailed Source File list of references and documents.

| | |
|---|---|
| 1-A-4 | Inventories of Materials Removed from Fushun Iron Works, Fushun. |
| 1-J-1 | Map of Mukden Arsenal showing condition as of March 1946 (Soviet removals and B-29 bomb damage). |
| 1-J-7 | Machinery and equipment carried away by Soviet Army - Manchu Iron Works. |

| | |
|---|---|
| 2-A-1 | Data on Processes, Flow Sheets and Diagrams - Manchu Iron Company, Anshan. |
| 2-A-5 | Report written in Japanese on removals compiled by Japanese Plant Personnel. Anshan Rolled Steel Company·(Anshan Steel Fabrication Company), Anshan. |
| 2-A-14 | Iron and Steel In Manchuria - report by T. L. Johnston. |
| 2-L-1 | Distribution Chart - Anshan Primary Sub-Station, Anshan. |
| 8-R-1 | Soviet Removal Data - Radio, Telephone and Telegraph Equipment. |
| 8-Y.1-1 | Information obtained from Japanese and Chinese sources with U. S. agency comments on the Total Japanese Investments in Manchuria. |
| 9-H-1 | Chronological listing of events during Soviet occupation of Manchuria Asano Cement Company, Kirin. |
| 101-UX-1 | Industrial Maps of Manchuria. |
| 101-XYZ-1 | OSS Report of Resources and Trade in Manchuria. (JANIS Chapter IX). |
| 102-J-1 | Japanese Small Tool Industry and Japanese Machine Tool Industry. |
| 102-W-1 | Report from SCAP |
| 104-V-1 | Guide to Geographical Names in China (3 copies) |
| 104-W-1 | Board on Geographical Names - Place Names in Manchuria, Cumulative List—April, 1945 (2 copies). |
| 104-W-3 | Board on Geographical Names - Directions for the Treatment of Geographical Names in Manchuria (2 copies). |
| 104-WT-1 | Report by Department of Interior. |
| 105-A-1 | Studies by Foreign Economic Administration. |
| 105-A-2 | " " " " " |

| | |
|---|---|
| 106-INT-1 | Reports and Studies by War Department. |
| 106-INT-X-1 | " " " " " " |
| 106-XY.1-1 | " " " " " " |
| 106-Y-1 | " " " " " " |
| 106-ZZ-1 | " " " " " " |
| 106-ZZ-2 | " " " " " " |
| 106-ZZ-3 | " " " " " " |
| 107-Z-1 | The Pacific Story, Mukden, Manchuria. |
| 108-INT-1 | Study by 14th Air Force. |
| 109-NR-1 | Supplies of Coal in Manchuria (3 copies). |
| 110-U-1 | Maps of Japan, China, Manchuria, U.S.S.R. |
| 110-U-5 | Key Maps--Korea and Russian Maritime Provinces. |
| 113-INT-X-1 | Studies by O.S.S. |
| 113-INT-X-2 | " " " |
| 113-ZZX-1 | " " " |
| 114-INT-1 | Studies by M.I.S. |
| 114-INT-3 | " " " |
| 114-INT-X-2 | " " " |
| 115-X-2 | Studies by Department of State. |
| 116-Y.1-1 | " " " " " |
| 117-I-1 | Studies by War Department. |
| 117-Y-1 | " " " " |
| 119-X-1 | Survey of Industries and Transportation in Tientsin Territory 3/20/46. |
| 201-T-1 | List of Plants and Factories in Anshan, Penchihu, Liaoyang and Yingkou Districts, Manchuria. |
| 201-W-1 | List of officials of the Chinese North East Economic Commission. |
| 201-X-1 | List of Factories in Mukden. |

| | |
|---|---|
| 201-X-2 | A General Estimate of the Leading Industries in Manchuria. |
| 201-X-3 | The Position of the Manchuria Heavy Industries Development Company and Its Subsidiaries. |
| 201-X-4 | Production and Capacity of the Subsidiary Firms of the Manchurian Heavy Industries Development Company. |
| 201-X-5 | The Manchuria Electric Power Company and Related Companies. |
| 201-X-6 | Analysis of the Total Investment of the Manchuria Heavy Industries Development Company and its Subsidiaries. |
| 201-X-7 | The Textile Industry in Manchuria. |
| 201-X-8 | The Subsidiaries of the South Manchuria Railway. |
| 201-X-9 | Analysis of Investment in the South Manchuria Railway and Its Subsidiaries and Related Companies. |
| 201-X-10 | The Japanese and Manchukuo Investment in Manchuria. (Reproduced in Appendix 1). |
| 201-X-11 | The Transportation and Communication Facilities of Manchuria and their Immediate Needs. |
| 201-ZW-1 | Industrial Equipments and Materials Removed by Soviet Troops from North Eastern China—Summary List, May, 1946. (Reproduced in Appendix 2-e) |
| 202-A-1 | Iron and Steel Industry No. 4, Detailed List of Damages. |
| 202-AG-1 | Nonferrous Metal Industry No. 5, Detailed List of Damages. |
| 202-B-1 | Coal Industry No. 2, Detailed List of Damages. |
| 202-C-1 | Chemical Industry No. 9, Detailed List of Damages. |
| 202-E-1 | Liquid Fuel Industry No. 3, Detailed List of Damages. |
| 202-INT-1 | Activities of Soviet Troops. |
| 202-J-1 | Machinery Industry No. 6, Detailed List of Damages. |
| 202-L-1 | Electrical Power No. 1, Detailed List of Damages. |

| | |
|---|---|
| 202-L-2 | Electrical Manufacturing Industry No. 8, Detailed List of Damages. |
| 202-P-1 | Photos of Manchurian Chemical Works, Dairen, Manchuria. |
| 202-R-1 | Transportation Equipment Industry No. 7, Detailed List of Damages. |
| 202-S-1 | Chinese Plant Directory. |
| 202-XY.1-1 | Comparative Table Showing Populations and Economic Prewar Interdependence of Japan and Countries Comprising the Far East Except Burmanand Thailand. |
| 301-F-1 | Shipbuilding—Manchuria. |
| 301-J-1 | Manchuria Electric Wire Company, Ltd., (Economic Report also). |
| 301-X-1 | Preliminary Zaibatsu and Japanese Government Investment Chart for Manchuria, Korea, Formosa, and Occupied China (3 vol.) |
| 301-X-2 | Report on the Factories in Manchuria. |
| 302-Y.1-1 | Economical Review of the North-Eastern District of China, covering:<br>I. Population.<br>II. Agriculture, Forestry and Live-Stock Industry.<br>III. Companies.<br>IV. Mining and Industry.<br>V. Foreign Trade. |
| 303-A-1 | Report on the Investigation of Damages in the Principal Factories of Anshan by a former Japanese official. |
| 303-B-1 | Report on Mining Development by former Japanese officials. |
| 303-B-2 | Report on Coal Mines by a former Japanese official. |
| 303-B-3 | Outline of the Penchihu Coal Mines. |
| 303-E-2-1 | Report on Fuel Industries in Manchuria by a former Japanese official. |

| | |
|---|---|
| 303-H-1 | Report on Cement, Glass and Firebrick Manufacture. |
| 303-J-1 | Report on Removals of Metal Working Industries in Mukden area compiled by Asst. Military Attache. |
| 303-J.2-1 | Report on Farm Implement Industry. |
| 303-L-1 | Short Sketches on the Damages of the Manchurian Electric Company, Ltd. |
| 303-L-2 | The Power Situation in Manchuria, July 1946. |
| 303-N-1 | Report on Railway Works, Locomotive and Car Inspecting Station. |
| 303-NR.2-1 | Report on Sugar Industry. |
| 303-NR.3-1 | Report on Beer Brewing Industry. |
| 303-NR.4-1 | Report on Tobacco. |
| 303-R-1 | Report on Equipment and Apparatus which was removed and carried away by the Soviet Army—Detail List—Manchuria Telephone and Telegraph Company. |
| 303-R-2 | Report on Telephone and Telegraph. |
| 303-T-1 | Report on Factories in Manchuria Listing Location, Operation, and Capacity (Target Data.) |
| 303-T-2 | Summary list of Equipments and Materials Removed by Soviet Troops in Changchun District. |
| 303-TT-1 | Target Data on Manchuria Supplied by Japanese. |
| 303-T.1-1 | Future Outlook of the Heavy Industries in the Northeast District of China. |
| 303-T.1-2 | Report on Precious Metals and Securities. |
| 303-T.1-3 | Report on the Investigation of Damages in the Principal Factories of Mukden. |
| 303-T.1-4 | Report on the Investigation of Damages in the Principal Factories in Fushun, July 8, 1946. |
| 303-ZZ-1 | Japanese Diary on Removal and Destruction - Anshan. |
| 304-A-1 | Report on Shihchingshan Steel Works (of North China Iron Manufacturing Company, Ltd.). |

| | |
|---|---|
| 304-B-1 | Baun Mine and Ranken Mine<br>Chinchankon Mineral Works<br>Tanin Coal Company, Ltd.<br>Tangku Factory, Tungri Chemical Industrial Company, Ltd.<br>Yao Hao Glass Company, Ltd.<br>Nippon Kokan Kabushiki Kaisha, Kinreichin Mine (Shantung)<br>Three Blueprints—Japanese. |
| 304-S—2 | Report on Chinese Technical Apprentice Training. |
| 304-WX-1 | List of Plants in North China, May 21, 1946. |
| 304-X—1 | Summary List of Equipment and Materials Removed by Soviet Troops in Kirin District. |
| 305-A—1 | Report on Ruen Iron Ore Company (Tokyo Branch Office). |
| 305-G—1 | Report on Choten Plant of Kahoku Keikinzoku Kabushiki Kaisha (North China Light Metal Company, Inc.). |
| 305-H—1 | The Cement Industry in Manchuria. |
| 305-I—1 | Japanese Petroleum Situation, Crude Oil Supplies and Refining Capacity. |

APPENDICES

# LIST OF APPENDICES

Appendix

1. Japanese and Manchukuo Investments in Manchuria
2. a. Translation of Japanese Diaries
   b. Notes on Visit to Chinese Communist Area
   c. State Department Notes re Soviet Removals
   d. Sino-Soviet Treaty, 14 August 1945
   e. Chinese Summary of Removals
3. Electric Power: Plant Inspection Reports, Individual Plant Summary Reports, and other data
4. Coal: Plant Inspection Reports and other data
5. Iron and Steel: Plant Inspection Reports and other data
6. Railways: Plant Inspection Reports and other data
7. Metal Working Industry: Plant Inspection Reports and other data
8. Non-Ferrous Mining and Metal Industries: Plant Inspection Reports and other data
9. Liquid Fuel and Lubricant Industry: Plant Inspection Reports and other data
10. Chemical, Food and Allied Industries: Plant Inspection Reports and other data
11. Cement Industry: Plant Inspection Reports, Individual Plant Summary Reports, and other data
12. Textiles: Plant Inspection Reports and other data
13. Paper and Pulp: Plant Inspection Reports and other data
14. Lumber: Plant Inspection Reports and other data

1

Appendix 1

# JAPANESE AND MANCHUKUO INVESTMENT IN MANCHURIA

Compiled by the Northeast Economic
Commission, Chinese National Government

NOTE. This was one of the sources consulted in arriving at the total Japanese Investment in Manchuria.

# THE JAPANESE AND MANCHUKUO INVESTMENT IN MANCHURIA

(Compiled by The Northeast Economic Commission,
Chinese National Government, Mukden, 6-5-45)

## I Total Japanese Investment in Manchuria

| | |
|---|---|
| 1 - Before Sept. 18, 1931 including South Manchuria Railway | ¥ 1,700,000,000 |
| 2 - Between 1931 and 1936 | 1,155,770,000 |
| 3 - Since outbreak of war, July 7, 1937 to 1944 | 7,878,343,000 |
| Total | ¥10,734,113,000 |

## II Analysis of Japanese Investment in Manchuria

1 - Investment in South Manchuria Railway

| | | |
|---|---|---|
| (a) Before Sept. 18, 1931 | | |
| S.M.R. stock | ¥ 387,156,000 | |
| S.M.R. bonds | 316,050,000 | ¥ 703,206,000 |
| (b) After Sept. 18, 1931 | | |
| S.M.R. stock | 813,047,000 | |
| S.M.R. bonds | 2,260,700,000 | |
| Loan | 135,350,000 | ¥ 3,209,097,000 |
| Total investment in South Manchuria Railway | | ¥ 3,912,303,000 |

| | |
|---|---|
| 2.- Japanese investment in Manchukuo Government Bonds | 3,912,303,000 |
| 3 - Japanese investment in Manchurian Heavy Industries Development Co., Ltd. | 803,330,000 |
| 4 - Japanese investment in Manchurian Electrical Power Co., Ltd. | 412,983,000 |
| 5 - Japanese investment in Manshu Takushoku Kosha (Immigration Co.) | 502,500,000 |
| 6 - Japanese investment in Manchurian Telegraph and Telephone Co. | 145,748,000 |
| Total for 1, 2, 3, 4, 5 & 6 | 6,821,864,000 |
| 7 - Japanese investment in other companies | 2,912,249,000 |
| GRAND TOTAL | ¥ 10,734,113,000 |

## III Investment of Manchukuo Government and the people in Manchuria (distributed in 260 large companies)

| | | |
|---|---|---|
| 1 - Company stocks: | | |
| (a) held by Government | ¥ 1,278,379,000 | |
| (b) held by people | 31,335,000 | ¥ 1,309,715,000 |
| 2 - Company bonds: | | |
| (a) held by Manchukuo Central Bank S.M.R. bonds | 210,000,000 | |
| (b) held by Manshu Kogyo Bank Telegraph and Telephone Bond | 22,000,000 | |
| Electric Power Co. Bond | 193,000,000 | |
| (c) held by Manshu Agricultural Bank Manshu Takushoku | 354,000,000 | 779,000,000 |
| 3 - Loan extended to big companies, (mostly by Manshu Kogyo Bank and Manshu Agriculture Bank, with small amount by Manshu Central Bank) | | |
| (a) loan extended by Banks | 4,951,130,000 | |
| (b) loan extended by Manchuria Heavy Industries Ltd, etc | 2,473,833,000 | 7,424,963,000 |
| 4 - Investment of some 6,300 smaller companies, outside the 260 large ones, (rough estimate) | | 500,000,000 |
| GRAND TOTAL | | ¥ 10,013,678,000 |

## IV Analysis of Investment made by Manchukuo Government and the People

1 - Manchukuo Central Bank:

| | |
|---|---|
| (a) loan to financial institution (including Manshu Kogyo Bank, Manshu Agricultural Bank, Yokohama Specie | ¥ 6,697,329,000 |

| | | |
|---|---|---|
| (b) loan to important companies | ¥ 1,861,246,000 | |
| (c) company bonds | 303,388,000 | |
| (d) company stocks | 10,033,000 | ¥ 8,870,996,000 |
| 2 - Manshu Kogyo Bank Saving Certificates | | 64,175,000 |
| 3 - Manshu Agricultural Bank Agricultural Saving Certificates | | 44,970,000 |
| 4 - Deposits: | | |
| Bank | 1,219,017,000 | |
| Postal Saving | 440,713,000 | 1,768,875,000 |
| GRAND TOTAL | | ¥ 10,639,871,000 |

V Indebtedness of Manchukuo Government to the People

| | | |
|---|---|---|
| 1 - Manchukuo Central Bank circulation | ¥ 13,000,000,000 | |
| 2 - Manchukuo Government Bonds ¥ 2,588,537,000<br>less amount held in Central Bank 377,296,000 | 2,211,241,000 | |
| 3 - Manshu Kogyo Bank, savings certificates | 64,175,000 | |
| 4 - Manshu Agricultural Bank, Agricultural savings certificates | 44,970,000 | 15,320,386,000 |

CF. Investment of Manchukuo Government and the people under heading III, amounting to ¥ 10,013,678,000. Before the Soviet invasion of Manchuria, the amount given to government officials and company staff as final payment before disbandment amounted to over ¥ 400,000,000. The Soviet army took from Manchuria about ¥ 450,000,000 unissued Manchurian notes.

Appendix 3-e-1

# Chronological Record Prepared by
# Mr. Seo, Formerly a Director of the
# Manchuria Iron and Steel Company, Anshan

August 15th:

Radio announcement of the cease of war.
Speech of President Kishimoto to the whole employees for the preservation of equipments with the factory as well as regarding the continuation of operation.

In the middle of the same month

Liaison officials were sent to each branch office informing them that they could manage affairs by themselves in the name of the head director of each branch office as the connection between the head office and the branch offices were feared to become impossible.
The Chinese labor service corps and the student labor service corps were disbanded.
Payment of employee's deposit was made to a small extent.

At the end of the same month

Some of the already paid deposit were partly recollected for the payment to the day labourers.
The Soviet air forces and mechanized troops passed Anshan continuously down southward.

August 21st:

Arrival of Major Ivanof at Anshan as the military envoy.

August 23rd:

Special service band was organized to guard the residence zone.

August 24th:

Started repair works of the employee training school so as to make it the Soviet barracks.

August 25th:

Inspection of the factory by the Soviet military envoy.

August 26th:

Special guard troop was organized to guard the factory.

August 27th:

Estimate of production was fixed - 2 blast furnaces to be operated, coal for coke 1,900 tons per day.
Arrival of Lieutenant Colonel Vigirekof as the commander of Anshan air forces as well as the garrison commander and also as the military governor -
Announcement of Russo-Chinese amicable treaty.

August 28th:

Inspection of the factory by Lieutenant Colonel Vigirekof. He expressed his satisfaction confirming the preservation of the equipments was well observed, and at the same time he expressed his desire for the normalization of operation.

August 29th:

Visit of Lieutenant Colonel Feodorf examining the financial condition of the company.

August 30th:

Visit of Major Kostorikof witnessing the status-quo of the company.
Arrival of the Soviet fighting troops at Anshan.

September 5th:

System of the company was partly changed substituting special service department and special service corps for special service headquarters.

September 8th:

Order of the Soviet army for the preparation of the following investigation. -

1. Capacity of production
2. Present equipment
3. Material and electric power and their route of supply
4. Requirements for production

according to which our production plan was established as follows:

| | |
|---|---|
| coal for coke | 5,000 tons |
| pig iron | 2,000 tons |
| steel ingot | 850 tons |
| steel material | 700 tons |
| crude tar | 170 tons |
| benzol | 25 tons |

September 11th:

Mr. Yu-pin-san was appointed Mayor of Anshan.
Frequent visits of Soviet engineers and propagandists amounting to over 10 persons.
Lieutenant Kozlof was appointed garrison commander at Anshan.
The new garrison commander urged us for the increased production.
Special trains for Fu-shun and Pen-si-fu to negotiate for the acquisition of coking coal.
The garrison commander urged the citizens to offer them various kinds of goods.

September 13th:

Loading of wheat flour for the Soviet army.

| | |
|---|---|
| 1st loading: | 450 tons |
| freight wagons used: | 17 cars |
| workers: | 340 |

The Soviet engineering investigation party headed by Colonel Dovroforsky arrived here calling upon the preparation of technical investigations. President Kishimoto met Colonel Vrukof, Soviet engineering officer, and perceived that the Soviet army authorities were not interested in reopening the factory.
Loading of wheat flour and rice for the Soviet army:

| | | |
|---|---|---|
| 2nd loading: | Wheat flour | - 349 tons |
| | Rice | - 55 tons |
| freight wagons used: | | 15 cars |
| workers: | | 240 |

September 20th:

The garrison commander and Colonel Dovroforsky urged the company to withdraw two-thirds of the existing equipments to be sent to the Soviet. The Soviet headquarters for removal work was organized within the company, headed by Colonel Gzalof and Lieutenant Colonel Liabof.

September 25th:

Removal work was started.

October 5th:

Fighting of Chinese communist army and the Chinese police bureau in front of the station, resulted in the retreat of the communist army 20 kilometers off the city upon the Soviet orders.

October 10th:

Company officials above the head of each department attended the anniversary of the foundation of Chinese Republic.

Loading of wheat flour for the Soviet army

| | |
|---|---|
| 3rd loading: | 12 tons |
| motor lorries used: | 3 |
| workers: | 50 |

October 13th:

Japanese settlement corporation in China, at Anshan, started business.

October 14th:

Two miscellaneous warehouses and a storehouse of oxygen were set fire by the mob.

October 15th:

To strengthen the factory guard, the Japanese army was mobilized. Many business workers as well as general citizens were mobilized for the removal work to promote its completion.

October 20th:

The removal work at Kon-chan-lin mine was completed.

October 24th:

Y. Fukuda, employee of the Welfare Department, was shot dead by the Soviet soldier during on guard at the warehouse at Yanagi-machi.

October 26th:

The warehouses of the company were ceded to the Soviet control.

October 31st

1,500 Chinese communist army entered Anshan.
Mr. Tsung Chen Tung was appointed Mayor of Anshan and Mr. Li Yao Kue as Vice-mayor.
President Kishimoto told the staff members to establish restoration plan as fast as possible and to repair the unremoved equipments so that we can hand over the factory in the working order to the Chinese authorities as the Soviet army was to leave here in a short time. And on the same day he delivered a speech to the same effect.

November 1st:

Arrival of President Takasaki and Director Okumura of the Manchuria Heavy Industry accompanied by Colonel Stradkovsky and his retinue by air and informed us that the whole companies under the Manchuria Heavy Industry were to cede the whole right and interests to the Soviet authorities, according to which we were forced to consent.

November 2nd:

Restoration plan with the remained equipments was established.

November 6th:

Evacuation of the Japanese army on guard and they were gathered in one quarter under the constant surveillance on the Soviet orders.

November 7th:

Special service troop of the company was fortified, increasing its member up to 1,200 after the evacuation of the Japanese army.

November 8th:

Most of the Soviet army and the engineering officers left here for Mukden and Dairen since the removal work was completed.
President Kishimoto ordered the whole employees to come to the company to keep the equipments in good order.

November 9th:

Visit of Lieutenant Colonel Pandarenko, successor of Colonel Gzarov, accompanied by Mr. Li, political commissioner, and Mayor Tsung, informing us that Lieutenant Pandarenko was to take hold of the company control and the watch of the company would be made by the Chinese communist army numbering 300 soldiers.

November 10th:

President Kishimoto delivered a speech telling the whole employees to come to the company to perform their daily routine till the restoration work be finished and formally ceded to the Chinese authorities.
The Japanese army remaining at Anshan was taken away northward accompanied by the Soviet army.
A member of the Chin-Je mine who had been detained at the Ing-kou Police Bureau, was rescued.
Motor-lorries were sent to Mukden to rescue the employees and their families numbering 130 who had fled from Ton-bien-dao and living in strained circumstances.

In the middle of November:

The Soviet army carried away coal, steel, materials, lumber, etc., to Dairen and Port Arthur.

Coal amounting to 40,000 tons was loaded to be consumed by the South Manchuria Railway Company.

November 22nd:

The Chinese communist army searched the main office building.

November 23rd:

Mr. Nishi, head of the Special Service Department, who had been detained in charge of the concealment of arms was set free.

November 25th:

The safes in the company were sealed for a time being.

November 28th:

President Kishimoto with Messrs. Kobayashi and Imazu was taken into custody by the Chinese communist army.

November 29th:

Up to this day started from August 20th the goods of every kind stored in the warehouses of the company were entirely taken away.

December 1st:

Mr. Funada, secretary of President Kishimoto, was arrested along with the maids of the President.

December 3rd:

Mr. Yano, managing director, and Mr. Koga, head of the General Affairs Department, were arrested by the Chinese communist army.

December 5th:

Major Klibin came to the company giving order to clean the factory and keep the remained equipment in good order.
The Soviet soldiers were to settle within the office building.
Trial was made for the rescue of the employees and their families at Chi-Ling-Tzu and Ching-Tzu.

December 15th:

The communistic city government declared that they legally received the factory, the city government, Mr. Yui was to come daily to the company.

December 25th:

Mr. Tanaka, managing director, want to Dairen.

December 27th:

Directors staying at Anshan were forced to subscribe the sum of ¥ 3,000,000.

December 31st:

Some representatives of the company met the Mayor and earnestly prayed for the release of the detained including President Kishimoto.

1946

January 4th:

Mr. Yui explained to Mayor Chen and others about the restoration of the company.

January 15th:

Mr. Tie Chung, of the Chinese Communist Party, arrived at Anshan to invite engineers working at the Shin-Hua works, Ton-bien-dao.

January 17th:

Mr. Chon Ming and Mr. Ie Shin Tsing were appointed President and Vice-president respectively.
Mr. Yang and Mr. Shun were appointed head of transportation department and head of mechanical department respectively.

January 26th:

A Soviet officer, colonel in rank, came from Mukden and declared that the company would be ceded to the city government and ordered to prepare necessary documents.

January 30th:

By the order of the Soviet authorities the handing over of the company to the city government was cancelled.

February 5th:

Mr. Galkobick, Soviet engineer, was appointed President of the company and Mr. Torukof as Vice-president.

February 6th:

The company was formally reorganized as the Soviet Control Factory and the new system was announced.

February 22nd:

Two Soviet engineers were newly added.

February 25th:

Mr. Morohashi, ex-head of the Special Service Headquarters, was arrested by the Chinese Communist Army.

February 28th:

Mr. Kobayashi who had been arrested by the Chinese Communist Army was set free.

March 8th:

Evacuation of the Soviet army from the company and the guard was to be made by the Chinese Communist Army.

March 11th:

Mr. Yano, managing director, and Mr. Koga, head of the general affairs department, were set free.

March 15th:

Announcement about the use of new bank notes issued from The Communist Bank of North Eastern China.

March 20th:

Mr. Iwamitsu, Chairman of the Japanese settlement corporation in China at Anshan, and others including Mr. Morohashi were shot dead by the Chinese Communist Army.

March 23rd:

The entire Soviet army removed from Anshan.
The Chinese Communist Army within the company evacuated here excluding some guard troops.

March 25th:

Telephone communication was made utterly impossible.
Special guard troop was organized by the Japanese bachelor employees numbering about 100 and member of the special service department

numbering 40 to keep guard at the head office building and the main entrance of the factory, research institute and telephone exchange office.
During these days the communist army permitted taking the company goods away, goods mostly coke, were taken away daily.

March 29th:

Mr. Amano, head of the Welfare Department, and Mr. Abe, head of General Affairs Department, were arrested by the Chinese Communist Army.

March 31st:

Director Furuye was arrested by the Chinese Communist Army.
All the cash kept in the safes was taken away by the Chinese Communist Army.

April 1st:

Director Furuye was set free.
At nightfall the main office building was set fire by the Chinese Communist Army. (3rd floor totally burnt down, 2nd floor half burnt)
A part of the Chinese Central Army marched into Anshan.

April 2nd:

The Central Army marched formally into the city.

April 12th:

From today, on for 5 days, the cleaning work of the factory was started by the former employees.

Appendix 2-a-2

## Chronological Report of Removals of the Manchurian Electro Chemical Industry Co. Ltd., Kirin, as reported by Japanese Director in charge.

September 15th, 1945:

Several engineering officers of Soviet Army came to the head office of Manchurian Electro Chemical Co. Ltd. Sera, Watanabe, and Gotoh, Directors of the Company, and Satake, Director of Manchuria Synthetic Rubber Co., interviewed with the officers, and explained about the general of the both companies by their request. After the explanation, they inspected the site of the coke, carbide and synthetic rubber factory.

September 16th:

Major Shirishefsky and other two majors, three of the engineering officers who had come yesterday called at the company again this day. Directors Sera, Gotoh and Satake met them. The officers ordered the Directors to prepare the explanations until the next day about the questions of which the following are principal:

(1) Short specifications, costs and weights of the main equipments and machineries of the coke, the major carbide, the minor carbide, and the synthetic rubber factories.

(2) Drawings showing the general plan of the company and each factory.

(3) Technical description of each factory, including the central manufacturing process.

(4) The names of the projectors and the constructors of each factory.

(5) The present stock and amount of the raw materials.

(6) Main machineries which have already arrived here but not yet installed.

(7) Grade of completion of each factory.

(8) The names of the principal engineers of both companies.

(9) Number of the Japanese and Chinese workers of each factory classified in specialty, namely machinist, electrician, and chemical workers.

September 17th and 18th:

Offered and explained about the drawings and description prepared for the requirements of the day before.

September 23rd:

Directors Sera, Goboh, and Satake were summoned by the Soviet Army to the office of Manchuria Artificial Petroleum Co. and ordered to execute the dismounting of the equipment and machines of the coke, carbide, and the synthetic rubber factories. Major Sherishefsky, according to the following directions which were given verbally:

(1) The dismounting of the equipments and machineries designated by Soviet Army to be commenced next day and completed until October 20, including packing and loading.

(2) Plans of the dismounting workers should be offered in two days.

(3) Persons responsible for the work should be determined for each factory.

(4) Necessary number of Chinese laborers should be reported.

(5) Necessary tools and materials required for the work should be mentioned and those which could not be prepared on the part of the Company should be specified.

(6) The dismounting equipments machineries should be marked according to the designation of Soviet Army.

(7) Main foods, such as rice, soy-bean, salt, etc., would be provided for the workers by Soviet Army.

(Supplementary) We made following proposals against the above directors:

(1) Necessary number of Chinese workers would be determined by us but the engagement and supervision in the work should be made by Soviet Army. (Adopted)

(2) Wages should be paid for Chinese workers (to be answered the next day)

(3) The guard by Soviet soldiers in the living section of the Japanese hoped to be somewhat strengthened, because of the guard power of Japanese will be weakened as the result of the fact that the most of the Japanese, who live in this section, engage in this dismounting work apart from their living section. (Adopted) designation of Soviet Army --

After the above order given Major Diment, who is responsible of the size of Soviet Army for this work, took the directors to the both carbide factories and synthetic rubber factory, in order to appoint on the site the equipments and machineries so be dismounted. The dismounting work of coke factory was removed for the time being.

September 24th:

The directors, Sera, Watanabe, Gotoh and Satake called on Major Diment at the office of synthetic rubber factory and consulted about the work in detail. Following two items were proposed this day by the directors to Major Diment:

(1) The order of the dismounting work should be delivered in the form of documents to the companies (not adopted)

(2) Minor carbide factory is the only one factory at present in Manchuria producing calcium carbide, which is indispensable for most industries, especially for repairing the rolling stocks of railway. Therefore the dismounting of minor carbide factory is hoped to be excluded. The directors handed a note about this fact written in English to the Major this day, it was ordered by Soviet Army that the dismounting work should be accomplished until October 15th, shortening by five days than the period which had been given yesterday.

September 25th:

We set about the work. (Beginning the dismounting work in practice) three hundred Japanese were engaged, one hundred being dispatched for each Factory.

September 26th:

The workers were increased up to four hundred.

September 27th:

The workers were increased up to five hundred.

October 5th:

Received an additional order to dismount one part of the machineries in coke factory. This work was imposed on the party engaging in major carbide factory.

October 8th:

Railway trucks arrived at the factories this day and truck-loading was commenced.

October 12th:

One hundred workers out of the party engaging in synthetic rubber factory were ordered to go to Daido Cement Manufacturing Company and take part in the dismounting work of that factory.

October 17th:

The dismounting work of minor carbide factory, including loading, completed.

October 18th:

The work of synthetic rubber factory and major carbide factory completed. The arrangement of the drawings of all the factories were begun from this day according to the directions of the Soviet officers. Fifteen engineers took part in this work.

October 24th:

The arrangement and packing of the drawings completed.

The cause of carrying away the stored materials by Soviet Army.

October 30th and 31st:

Stationaries, miscellaneous tools and instruments, and so on, which had been stored in the central warehouses, were carried away by Soviet Army, amounting to eight railway wagons-load. About two hundred Japanese requisitioned for loading wagons without wage.

October 10th - 18th:

Telephone and business furniture of the head office and miscellaneous materials such as steel plate, reinforcing bar, stored in the central warehouse were packed and loaded in 17 waggons by labour of both Chinese and Japanese with wage.

Appendix 2-a-3

## Chronological Report of Removals From the Asano Cement Company, Kirin, as Prepared by the Former Japanese Plant Manager

October 9th, 1945:

Four Soviet engineering officers suddenly came to the factory and issued an order to dismount the factory's all machineries and equipments which were to be carried into the USSR.

October 10th:

Four Soviet officers and twenty soldiers lodged in the office of the company, and it was made as the headquarter. The dismounting work took place at once by calling for all Japanese employees, 123 Japanese employees of the Manchurian Electro-Chemical Industry Co., Ltd., some of employees of the Alcohol Co., Meiji Milk Co., Gluten Works, all of which being located in neighborhood and 65 young colonists of the Tosausho colonization group who had been lodging among the company's residences, and in addition to them some 129 distressed Japanese attending from the Japan Society having joined them, making the total number to about 800 persons. They were to work daily for the purpose of dissection of the factory's machineries and equipments.

October 11th:

The work begun on this day (commencing at 7 AM, ending at 6 PM).

October 18th:

An order was given to the company to complete the loading of machineries and equipments thus dismounted by the 25th of the month. These consisted 2 Rotary Kilns, 6 dryers for raw materials and coal, and all other machineries and equipments with exception of the convey machineries.

October 21st:

Twenty cars were brought into the company's platform at 1 PM and by the midnight about 10 tons of machineries being loaded at effort in working overtime by all.

October 22nd:

Completed the loading of 20 cars by 9 PM working overtime by all.

October 23rd:

Twenty loaded cars started from the company's platform.

October 24th:

A Soviet commanding officer came and gave to the company another order for additional 2 Rotary Kilns and 6 dryers omitting 2 Japanese crushing mills which had been concluded in the first order. This new order should have to be completed by November 5.

October 26th:

Early in the morning an order was issued to stop dismounting of the two Rotary Kilns, and instead the two Japanese crushing mills to be dismounted. At 11 AM another order was issued to make additional of a large gear wheel (regulation speed) attached to the Rotary Kilns. This additional order, however, being cancelled finally.

October 30th:

Our requested pays for the work done up to the 25th of this month amounting to about ¥500,000 were paid for the first time. Offering prizes for the completion of all dismounting by the 1st of November were made for which we made a protest against as it was impossible to do so, and accordingly the order to dismount the Japanese Mill was again cancelled.

November 1st:

The orders received were thoroughly executed.

The most important machineries were as follows:

| | |
|---|---|
| 3 | Row Material crushing machines |
| 2 | Clay dryers |
| 3 | Coal dryers |
| 2 | Coal powdering machines |
| 3 | Blowers for Rotary Kilns |
| 1 | Cement powdering machines |
| 2 | Bagging machines |
| 2 | Boilers |
| 2 | Generators |
| 107 | Motors |
| 2 | Transformers |
| 18 | Constructive machines of all kinds |

Many other preservations for the factory.

November 2nd:

Deliveries of all the dismounted articles from the beginning, amounting to 83 loaded cars and weighing about 1,300 tons had been completed.

November 4th:

The officer in charge — Colonel -- suddenly called upon the factory manager's private residence and demanded him to show all papers concerning to the dismountings, which were shown, but they were taken away by him. It became known to our great regret that it was the purpose to extinguish evidences.

In short the dismounting work had been forced upon us by the Soviet army and the period required so doing for such work allowed by them only 20 days. The work naturally could not be executed in satisfactory way. As the result it would be very difficult to reconstruct them and operate smoothly, in spite of fact that the Soviet's desire supposed to have them reconstructed in their own country. The remaining machineries and equipment had been obliged to be left as they were due to the difficulty in securing oxygen for dismounting them.

In this connection we would say that they induced our engineers to go over to the USSR which was of course being refused by all.

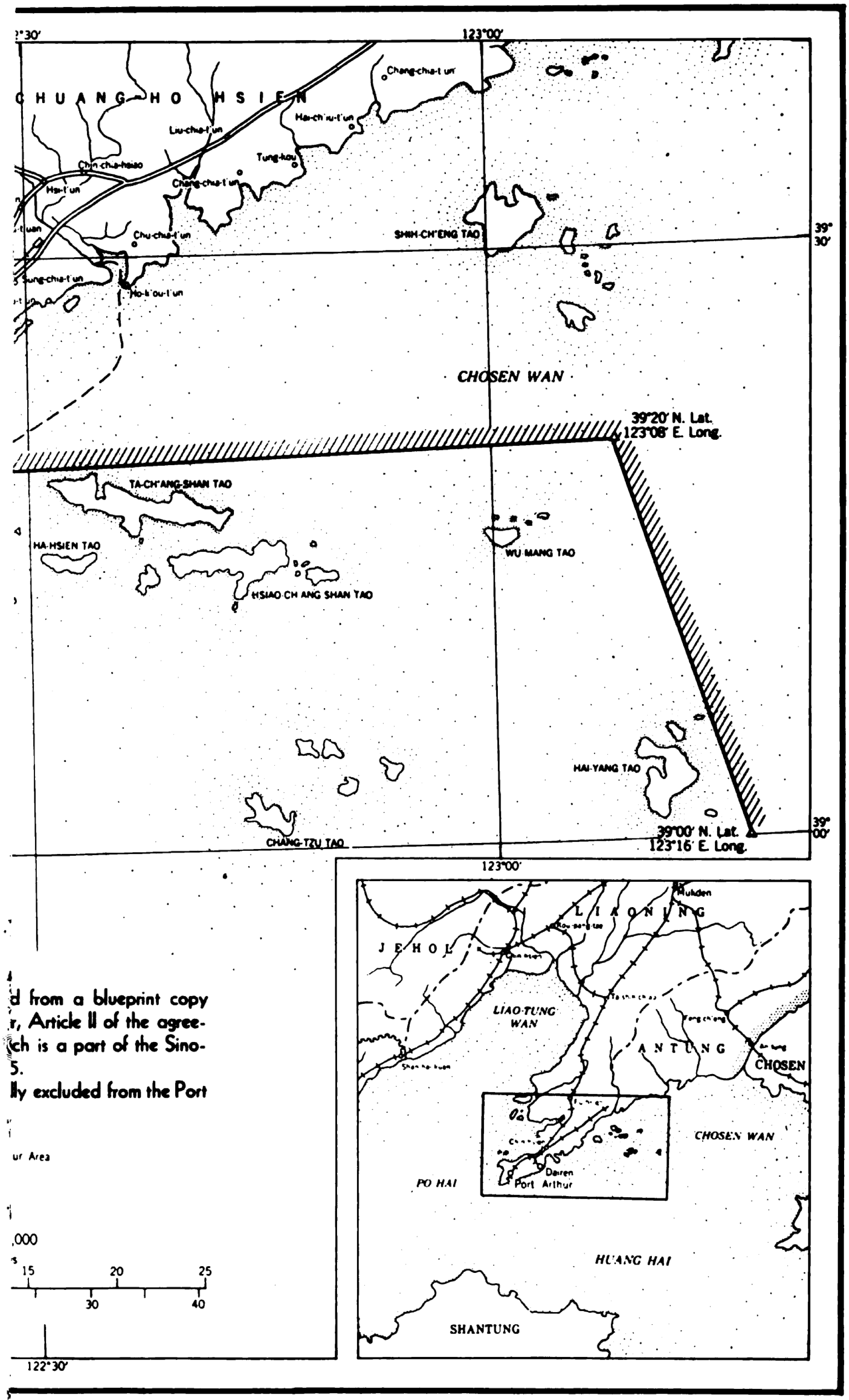
November 5th:

All Soviets soldiers evacuated the factory.

December 2nd:

A Soviet officer re-appeared and gave us an order to clean the factory and put it in order. We were able to execute it within a week. Since then seven Soviet soldiers had stationed in the office and taken guard over the factory until April 4, this year.

During that time, they took hold of some of the factory's belongings and sold them for their account (stolen articles were 6 motors, felt cloth for slate manufacturing, belt, etc.) Not only that, they invaded private dwellings to loot and tried to violate girls and young women and to do all sorts of behavior which acts had been to our deep sorrow as well as great suffering.



2°30′
123°00′
CHUANG-HO HSIEN
Chang-chia-t'un
Liu-chia-t'un
Hai-ch'iu-t'un
Tung-kou
Chin-chia-hsiao
Hsi-t'un
Chang-chia-t'un
Chu-chia-t'un
Sung-chia-t'un
Ho-k'ou-t'un
SHIH-CH'ENG TAO
39° 30′
CHOSEN WAN
39°20′ N. Lat. 123°08′ E. Long.
TA-CH'ANG-SHAN TAO
HA-HSIEN TAO
HSIAO CH'ANG SHAN TAO
WU-MANG TAO
HAI-YANG TAO
CHANG-TZU TAO
39°00′ N. Lat. 123°16′ E. Long.
39° 00′
123°00′
d from a blueprint copy
r, Article II of the agree-
ch is a part of the Sino-
5.
lly excluded from the Port
ur Area
,000
15
20
25
30
40
122°30′
Mukden
LIAONING
JEHOL
LIAO-TUNG WAN
ANTUNG
CHOSEN
CHOSEN WAN
PO HAI
Dairen
Port Arthur
HUANG HAI
SHANTUNG

:mit

fuly

n,

nt-
art
ir
he
ern
nese
had
rm-
er-

of

rom

r-

li-

rate
by

by
of

Chron

Novem

facto
paper
were
was t

Sovie
by t
satis
cons
desi
rema
they
them

to g

Nove

Dece

fac
Sin
gua

lon
fel
inv
wom
sor

Appendix 2-b

## NOTES ON VISIT BY PAULEY MISSION TO COMMUNIST-HELD TERRITORY IN NORTHERN MANCHURIA

After considerable negotiations, arrangements were made to permit the Pauley Mission to visit Harbin and Mutanchiang for a period of five days. This visit was made during the period from June 28 to July 2, 1946.

It appeared to members of the Pauley Mission that the Chinese Communists made a sincere effort to entertain and assist the Mission, but they lacked the organization and the will to cooperate with the whole-heartedness that the Mission had experienced from the Chinese Nationalist Government. Considerable confusion and delay was encountered by the Mission in Communist territory. Undoubtedly, a large part of this confusion was due to the fact that with limited time at their disposal the Mission had planned a program beyond the capacity of the Communist organization and facilities. The Mission's work in Southern Manchuria had been facilitated by well-organized cooperation by Chinese Government officials, most of whom were technically trained men who had been educated in America or Europe. Political subjects had been normally treated as a secondary consideration. However, in Communist territory the Mission dealt with politicians and military men entirely. There were instances in which apparent deception and misstatements of fact were practised on the Mission. At times members of the Mission were treated with obvious suspicion. Almost all Chinese Communist politicians appeared deeply concerned in preventing any criticism from falling upon the Soviets.

While in Harbin the Mission was entertained by Major General Zhuravleff, who, with a staff of officers and troops from the Soviet Railway Engineers, was stationed in Harbin to handle the Soviet interests in the Chinese Changchun railway. He explained to the Mission that his men, although bearing military titles and wearing Soviet military uniforms, were in fact non-combatant Government officials. The General displayed a sincere courtesy and an apparent desire to cooperate fully with the Mission. However, there a number of statements made by his subordinate officials which were misleading.

A well-equipped and heavily guarded special train was supplied by the Communists for a trip to Mutanchiang, about 200 miles southeast of Harbin. No Americans had visited this area since the start of World War II. The Communist officials at Mutanchiang made a wholehearted effort to welcome and provide for the Mission's comfort under conditions which were difficult.

During the war the Japanese had a large military establishment in Mutanchiang and had made a determined stand against the advancing Soviet troops. Considerable war damage was in evidence. Ample evidence indicated that the Japanese had conducted considerable demolition before retiring from the city. On the other hand, convincing evidence was found that large scale removals of industrial equipment had been made. Local Chinese Communist officials insisted that all such removals had been made either by the Japanese or local Chinese. Such claims could not be supported by many of the observations made by the Pauley Mission.

These officials, while extending every courtesy officially, were certainly less than straightforward in supplying information about Japanese industrial plants or in aiding the Mission to make a thorough investigation. They appeared primarily concerned with political questions and were outspoken in their criticism of America's policies in China. They dwelt at considerable length on the subjects of democracy, freedom of speech, imperialism, etc., but a superficial questioning indicated that they used these expressions only in the approved Soviet sense.

On returning to Harbin, the Mission again experienced considerable difficulty in making its investigations. However, from observations made during the limited time at the Mission's disposal, it appeared that Japanese industries in Harbin had been subjected to the same pattern of removals and looting as those observed in Southern Manchuria.

Practically every meal except breakfast was in the form of a banquet, and political matters were frequently introduced into the conversations. The dominant Chinese political figure in Harbin was General Li Li-San, who apparently is political Commissar to General Lin Piao, the Commanding General of all Chinese Communist forces in Manchuria. General Li Li-San is a member of the present Chinese Communist Central Committee and was formerly head of the Chinese Party from 1925 to 1932. Socially he is an intelligent, alert, and congenial person with a good sense of humor.

While members of the Mission endeavored not to express criticism of the Soviets, Chinese Communists, or the Chinese Nationalist Government, General Li Li-San and other Communist officials were always alert to rationalise any situation that might imply any shortcomings on the part of the Soviets.

It was explained to General Li Li-San that the objective of the Mission was to determine the extent and whereabouts of Japanese assets in which the Chinese as well as other Allies had a definite interest;

that if the Pauley Mission came to the conclusion that the Japanese equipment was still in China, it would probably recommend that the value of it be charged against Chinese reparations claims. However, if the machinery had been removed by a foreign power, the recommendation would then be that such nation be so charged. The interests of the Chinese people in the matter of reparations were emphasized. However, the Chinese Communist politicians entering into these discussions did not deviate from their position that only Japanese and Chinese were responsible for all equipment removals.

Considerable evidence was seen in Communist-held areas that an anti-American propaganda campaign was being conducted. The opinion of the members of the Mission was that much of the sincere concern displayed for their safety was inspired by the fear of repercussions from this propaganda. However, the Mission observed no evidences of ill will toward them in the brief opportunities they had to come in contact with the inhabitants. Members of the Mission were heavily guarded most of the time but they were convinced that the primary objective of this guard was to protect them from violence and not to prevent the Mission from observing conditions.

General Li Li-San was rather expansive on several occasions concerning the desire of the Chinese Communist Party to obtain financial and technical assistance from industrialists in the United States. He reported that the Communists were particularly anxious to develop the coal and textile industries and that a Commission had been set up at Yenan with power to negotiate with private capital for such development in Communist-held territory. The General stated that he felt certain that adequate guarantees and protection could be offered to attract foreign capital and technicians.

One of the most interesting and significant pieces of information obtained by the Pauley Mission in Harbin concerned the activities of I. I. Tschurin and Company. Both Chinese Communist officials and officials of the company were extremely evasive to members of the Pauley Mission on this subject. However, sufficient information was obtained to open the way for further inquiries in Mukden at a later date.

Apparently this company has been acquired by the Soviet Trade Commission in Moscow, since the Soviet entry into Manchuria in August 1945, and has taken over the control and operation of a large number of assets formerly owned by the Japanese. In Harbin, for instance, apparently all Japanese plants which had not been stripped and looted were under the control of this company or the Railway. I. I. Tschurin and Company had taken over a cement plant, a brewery, an alcohol plant, a timber yard, a refrigeration plant, and doubtless many other Japanese assets in Harbin.

For the past 50 years this firm has been one of the largest merchandising concerns in Manchuria. Before World War II it had 65 agencies in all the leading cities of Manchuria, and dealt as manufacturers, importers, exporters, and merchants on a wholesale and retail basis.

This company was originally established by a Russian named I. I. Tschurin in 1868 to do business in Siberia. The company gradually expanded to Manchuria where it was centralized in Harbin after the Russian Revolution. The company apparently fell into evil days with the Japanese acquisition of Manchuria, and in 1936 the Hong Kong and Shanghai Bank, a British concern, acquired 98 percent of the company's stock, which at the time had a par value of 4,614,000 Manchurian dollars. The exchange rate at the time was about 4 to 1 with the American dollar. However, the actual value of this stock was reported as being considerably more. With the outbreak of hostilities in December 1941, the Hong Kong and Shanghai Bank gave a power-of-attorney to a White Russian named Ostrenko, Chief Clerk of the Harbin branch of the Bank, for the purpose of looking after the Bank's properties and interests in Harbin during the war. Shortly after the Soviets occupied Harbin the stock of I. I. Tschurin and Company held by the Hong Kong and Shanghai Bank was sold by Ostrenko to the Soviets reportedly for its par value in Soviet occupational currency. At the time the Mission was in Manchuria, the occupation Yuan which had received the backing of the Chinese Government was selling on the streets at 250 to 300 for one US dollar. The Hong Kong and Shanghai officials have been unable to contact Mr. Ostrenko for an explanation of his actions. In an interview with an American newspaperman, Ostrenko was reported to have stated that he acted in the best interests of the Hong Kong and Shanghai Bank in making the sale.

During the Soviet occupation of Mukden, I. I. Tschurin and Company acquired a large number of Japanese properties, including a brewery, a bottle factory, a soap factory, a paper mill, two printing plants, and over 200 Japanese homes. Except for railway property, this includes some of the more important Japanese assets in Mukden from which the equipment had not been removed or which had been looted.

The Chinese Government has since taken over these Japanese properties in Mukden from I. I. Tschurin and Company and has refused to recognize the validity of the transactions which were conducted while the Soviets were in control. Chinese officials stated that they have obtained statements from former Japanese owners to the effect that the acquisitions by I. I. Tschurin and Company were forced sales and in very few cases were any payments made.

Apparently I. I. Tschurin and Company has been used by this Soviet Commission as a means to acquire, or at least obtain a claim against, many Japanese assets in the numerous Manchurian communities where this company maintained stores and agencies.

From information obtained, British authorities probably will take action in this matter when more complete information is available. The activities of this concern have been, and promise to be, a source of contention between the Chinese and Soviet authorities and probably will result in considerable discussion during settlement of reparation claims on Japanese assets in Manchuria.

For further details of the Pauley Mission's visit to Communist-held territory see Source File 11-S-1.

It is probable that I. I. Tschurin and Company was not the only operation of this nature conducted by the Soviets with occupational currency.

# I. I. Tschurin & Co., Ltd.

Manufacturers, Importers and Exporters

## UNIVERSAL STORES

## Agricultural, Technical and Automobile Depts.

**HEAD OFFICE:**

**HARBIN, MANCHOUKUO**

**BRANCHES:**

**Kobe, Dairen, Hsinking, Mukden, Ssupingkai, Kirin, Tsitsihar, Hailar, Heiho, Pokutu, Antung, Chinhsien, Hakuro, Moho, Opu, Huma; Kaikukang and Kinchanshen.**

**The Three Rivers District: Dragotzenka, Popiray, Schiuchie, Dubovaya, Tuluntuy.**

**AGENCIES:**

**65 all over Manchoukuo**

AD. 38

Advertisement taken from Japan - Manchoukuo Year Book for 1940.

Appendix 2-c

## STATE DEPARTMENT NOTES RE SOVIET REMOVALS

Secretary of State James F. Byrnes on February 9, 1946 instructed the American Embassies in Chungking and Moscow to present the following views to the Chinese Government and the Government of the USSR, respectively:

"Current reports of discussions between officials of the Chinese Government and the Russian Government with regard to the disposition and control of industrial enterprises in Manchuria give concern to this Government.

"The Sino-Soviet Treaty and agreements signed August 14, 1945, provide for joint Sino-Soviet control over certain trunk railways in Manchuria, but these agreements exclude reference to any similar control over industrial enterprise in Manchuria. It is the understanding of the United States Government, which was kept informed of the course of negotiations which led up to the agreements, that exclusive Sino-Soviet governmental control over Manchurian enterprise would be limited to the railways dealt with in the aforesaid agreements. It is therefore disturbing to this Government to receive reports that discussions are under way which might result in the establishment of exclusive Sino-Soviet control over industrial enterprises in Manchuria. Under present conditions, when free access to Manchuria is not open to nationals of other powers and equality of opportunity in seeking participation in the economic development of Manchuria is denied Americans and other Allied nationals, it is felt that negotiation of agreements between the Chinese and Russian governments with regard to industries in Manchuria would be contrary to the principle of the Open Door, would constitute clear discrimination against Americans who might wish an opportunity to participate in the development of Manchurian industry, and might place American commercial interests at a distinct disadvantage in establishing future trade relations with Manchuria.

"Directly related to this matter of the industries in Manchuria is the matter of reparations policy for Japan because the major portion of the industries of Manchuria were Japanese-owned prior to the defeat of Japan. This Government considers that the ultimate disposition of Japanese external assets, such as the industries in Manchuria, is a matter of common interest and concern to those Allies who bore the major burden in defeating Japan. This Government is now preparing a general policy outline for consideration by the concerned Governments with regard to Japanese reparations. It will be suggested that an inter-Allied Reparations Commission for Japan be established, and that one of the primary functions of this Commission will be the final allocation of Japanese external assets among the various claimant nations. It would seem, therefore, most inappropriate at this juncture for any final disposition to be made of Japanese external assets in Manchuria either by removal from Manchuria of such industrial assets as 'war booty' or by agreement between the Russian and Chinese Governments for the control of ownership of those assets.

"The Government of the United States desires to be cooperative with the Chinese and Soviet Governments in seeking a solution of the problems outlined above and it hopes that the other two Governments are animated by a similarly cooperative spirit. It would therefore appreciate being informed of any discussions which the two Governments may be having or may plan to have or any action they may have taken, in regard to the disposition or control of industrial enterprises in Manchuria and we would welcome full and frank discussion of the general problems."

---

The Secretary of State today announced that he had received a reply from the Chinese Foreign Office, which reads in part:

"The Soviet Government declared in a memorandum addressed to Chinese Government on January 21, 1946 that all Japanese enterprises in the Chinese northeastern provinces which had rendered services to the Japanese Army were regarded by Soviet Union as war booty of Soviet forces. The Chinese Government considers this claim of Soviet Government as far exceeding the scope of war booty as generally recognized by international law and international usage and for this reason the two governments have not been able to reach a unanimity of views of fundamental principles involved.

"In another memorandum presented to officials of the Generalissimo's Headquarters in Changchun the Soviet Government declared that it proposed to hand over to China a part of the Japanese enterprises which Soviet Union regarded as war booty while remaining enterprises (including specified coal mines, power plants, iron and steel industries, chemical industries and cement industries) were to be jointly operated by China and Soviet Union. Chinese Government on its part has found it impossible to agree to this Soviet proposal because it goes beyond provisions of the Sino-Soviet agreements of August 14, 1945 and is contrary to the aforesaid stand of Chinese Government regarding Japanese properties and enterprises in China."

**Appendix 3-d**

# Sino-Soviet Treaty of Friendship and Alliance

## TREATY OF FRIENDSHIP AND ALLIANCE BETWEEN THE REPUBLIC OF CHINA AND THE U.S.S.R.

The President of the National Government of the Republic of China, and the Presidium of the Supreme Soviet of the U.S.S.R.,

Desirous of strengthening the friendly relations that have always existed between China and the U.S.S.R., through an alliance and good neighborly post-war collaboration,

Determined to assist each other in the struggle against aggression on the part of enemies of the United Nations in this world war, and to collaborate in the common war against Japan until her unconditional surrender,

Expressing their unswerving aspiration to cooperate in the cause of maintaining peace and security for the benefit of the peoples of both countries and of all the peace-loving nations,

Acting upon the principles enunciated in the joint declaration of the United Nations of January 1, 1942, in the Four Power Declaration signed in Moscow on October 30, 1943, and in the Charter of the International Organization of the United Nations.

Have decided to conclude the present Treaty to this effect and appointed as their Plenipotentiaries:

The President of the National Government of the Republic of China;

His Excellency Dr. Wang Shih-chieh, Minister for Foreign Affairs of the Republic of China,

The Presidium of the Supreme Soviet of the U.S.S.R.;

His Excellency Mr. V. M. Molotov, the People's Commissar of Foreign Affairs of the U.S.S.R.,

Who, after exchanging their Full Powers, found in good and due form, have agreed as follows:

### *Article I*

The High Contracting Parties undertake in association with the other United Nations to wage war against Japan until final victory is won. The High Contracting Parties undertake mutually to render to one another all necessary military and other assistance and support in this war.

### *Article II*

The High Contracting Parties undertake not to enter into separate negotiations with Japan and not to conclude, without mutual consent, any armistice or peace treaty either with the present Japanese Government or with any other government or authority set up in Japan which do not renounce all aggressive intentions.

### *Article III*

The High Contracting Parties undertake after the termination of the war against Japan to take jointly all measures in their power to render impossible a repetition of aggression and violation of the peace by Japan.

In the event of one of the High Contracting Parties becoming involved in hostilities with Japan in consequence of an attack by the latter against the said Contracting Party, the other High Contracting Party shall at once give to the Contracting Party so involved in hostilities all the military and other support and assistance with the means in its power.

This article shall remain in force until such time as the organization "The United Nations" may on request of the two High Contracting Parties be charged with the responsibility for preventing further aggression by Japan.

### *Article IV*

Each High Contracting Party undertakes not to conclude any alliance and not to take any part in any coalition directed against the other High Contracting Party.

### *Article V*

The High Contracting Parties, having regard to the interests of the security and economic development of each of them, agree to work together in close and friendly collaboration after the coming of peace and to act according to the principles of mutual respect for their sovereignty and territorial integrity and of non-interference in the internal affairs of the other contracting party.

---

The Embassy at Chungking transmitted to the Department of State, with a despatch dated Dec. 17, 1945, the English translation of the accompanying treaty and agreements between the Governments of China and the Union of Soviet Socialist Republics signed at Moscow Aug. 14, 1945:

The following minutes of the meeting of July 11, 1945 in Moscow were received from the American Embassy at Chungking by telegram:

MINUTES.

At the fifth meeting held on July 11, 1945 between Generalissimo Stalin and Dr. T. V. Soong the question of the withdrawal of Soviet troops from Chinese territory after the participation by the U.S.S.R. in the war against Japan was discussed.

Generalissimo Stalin would not like to have a clause in the agreement covering the entry of Soviet troops into Manchuria which provides for the withdrawal of Soviet troops within three months after the defeat of Japan. However, he said that after the capitulation of Japan the Soviet troops would commence to withdraw within three weeks.

Dr. Soong asked how long it would take to complete the withdrawal. Generalissimo Stalin said he thought the withdrawal could be completed in not more than two months.

Dr. Soong further asked when [whether?] the withdrawal would be definitely completed within three months. Generalissimo Stalin said three months would be the maximum for the completion of the withdrawal. Moscow, *August 14, 1945.*

### Article VI

The High Contracting Parties agree to render each other every possible economic assistance in the post-war period with a view to facilitating and accelerating reconstruction in both countries and to contributing to the cause of world prosperity.

### Article VII

Nothing in this treaty shall be so construed as may affect the rights or obligations of the High Contracting Parties as members of the organization "The United Nations".

### Article VIII

The present Treaty shall be ratified in the shortest possible time. The exchange of the instruments of ratification shall take place as soon as possible in Chungking.

The Treaty comes into force immediately upon its ratification and shall remain in force for a term of thirty years.

If neither of the High Contracting Parties has given notice, a year before the expiration of the term, of its desire to terminate the Treaty, it shall remain valid for an unlimited time, each of the High Contracting Parties being able to terminate its operation by giving notice to that effect one year in advance.

In faith whereof the Plenipotentiaries have signed the present Treaty and affixed their seals to it.

Done in Moscow, the Fourteenth August, 1945, corresponding to the Fourteenth day of the Eighth month of the Thirty-fourth year of the Chinese Republic, in two copies, each one in the Russian and Chinese languages, both texts being equally authoritative.

| | |
|---|---|
| THE PLENIPOTENTIARY OF THE SUPREME SOVIET OF THE U.S.S.R. | THE PLENIPOTENTIARY OF THE PRESIDENT OF THE NATIONAL GOVERNMENT OF THE REPUBLIC OF CHINA. |

## [*Exchange of Notes Relating to the Treaty of Friendship and Alliance*]

*August 14, 1945.*

YOUR EXCELLENCY,

With reference to the Treaty of Friendship and Alliance signed today between the Republic of China and the U.S.S.R., I have the honor to put on record the understanding between the High Contracting Parties as follows:

1. In accordance with the spirit of the aforementioned Treaty, and in order to put into effect its aims and purposes, the Government of the U.S.S.R. agrees to render to China moral support and aid in military supplies and other material resources, such support and aid to be entirely given to the National Government as the central government of China.

2. In the course of conversations regarding Dairen and P[illegible] and regarding the joint operation of the [illegible]chun Railway, the Government of the U.S.S.R. regarded the Three Eastern Provinces as part of China and reaffirmed its respect for China's full sovereignty over the Three Eastern Provinces and recognize their territorial and administrative integrity.

3. As for the recent developments in Sinkiang the Soviet Government confirms that, as stated in Article V of the Treaty of Friendship and Alliance, it has no intention of interfering in the internal affairs of China.

If Your Excellency will be so good as to confirm that the understanding is correct as set forth in the preceding paragraphs, the present note and Your Excellency's reply thereto will constitute a part of the aforementioned Treaty of Friendship and Alliance.

I take this opportunity to offer Your Excellency the assurances of my highest consideration.

(Signature) V. M. MOLOTOV

*August 14, 1945.*

YOUR EXCELLENCY:

I have the honour to acknowledge receipt of Your Excellency's Note of today's date reading as follows:

[Here follows the text of the above note from V. M. Molotov.]

I have the honour to confirm that the understanding is correct as set forth above.

I avail myself of this opportunity to offer to Your Excellency the assurance of my highest consideration.

(Signature) WANG SHIH-CHIEH

## [*Exchange of Notes on Outer Mongolia*]

*August 14, 1945.*

YOUR EXCELLENCY:

In view of the desire repeatedly expressed by the people of Outer Mongolia for their independence, the Chinese Government declares that after the defeat of Japan should a plebiscite of the Outer Mongolian people confirm this desire, the Chinese Government will recognize the independence of Outer Mongolia with the existing boundary as its boundary.

The above declaration will become binding upon the ratification of the Treaty of Friendship and Alliance between the Republic of China and the U.S.S.R. signed on August 14, 1945.

I avail myself of this opportunity to offer to Your Excellency the assurance of my highest consideration.

(Signature) WANG SHIH-CHIEH

*August 14, 1945.*

YOUR EXCELLENCY:

I have the honour to acknowledge receipt of Your Excellency's Note reading as follows:

[Here follows the text of the above note from Wang Shih-chieh.]

The Soviet Government has duly taken note of the above communication of the Government of the Chinese Republic and hereby expresses its satisfaction therewith, and it further states that the Soviet Government will respect the political independence and territorial integrity of the People's Republic of Mongolia (Outer Mongolia).

I avail myself of this opportunity to offer to Your Excellency the assurance of my highest consideration.

(Signature) V. M. MOLOTOV

## AGREEMENT CONCERNING DAIREN

In view of a Treaty of Friendship and Alliance having been concluded between the Republic of China and the U.S.S.R. and of the pledge by the latter that it will respect Chinese sovereignty in the control of all of Manchuria as an integral part of China; and with the object of ensuring that the U.S.S.R.'s interest in Dairen as a port of entry and exit for its goods shall be safeguarded, the Republic of China agrees:

1. To declare Dairen a free port open to the commerce and shipping of all nations.

2. The Chinese Government agrees to apportion in the mentioned port for lease to U.S.S.R. wharfs and warehouses on the basis of separate agreement.

3. The Administration in Dairen shall belong to China.

The harbor-master and deputy harbor-master will be appointed by the Chinese Eastern Railway and South Manchurian Railway in agreement with the Mayor. The harbor-master shall be a Russian national, and the deputy harbor-master shall be a Chinese national.

4. In peace time Dairen is not included in the sphere of efficacy of the naval base regulations, determined by the Agreement on Port Arthur of August 14, 1945, and shall be subject to the military supervision or control established in this zone only in case of war against Japan.

5. Goods entering the free port from abroad for through transit to Soviet territory on the Chinese Eastern and South Manchurian Railways and goods coming from Soviet territory on the said railways into the free port for export shall be free from customs duties. Such goods shall be transported in sealed cars.

Goods entering China from the free port shall pay the Chinese import duties, and goods going out of other parts of China into the free port shall pay the Chinese export duties as long as they continue to be collected.

6. The term of this Agreement shall be thirty years and this Agreement shall come into force upon its ratification.

## PROTOCOL TO THE AGREEMENT ON DAIREN

1. At the request of the U.S.S.R. the Chinese Government leases to the U.S.S.R. free of charge one half of all port installations and equipment. The term of lease shall be thirty years. The remaining half of port installations and equipment shall be reserved for the use of China.

The expansion or re-equipment of the port shall be made by agreement between China and U.S.S.R.

2. It is agreed that the sections of the Chinese Changchun Railway running from Dairen to Mukden that lie within the region of the Port Arthur naval base, shall not be subject to any military supervision or control established in this region.

## AGREEMENT ON PORT ARTHUR

In conformity with and for the implementation of the Treaty of Friendship and Alliance between the Republic of China and the U.S.S.R., the High Contracting Parties have agreed as follows:

### *Article I*

With a view to strengthening the security of China and the U.S.S.R. against further aggression by Japan, the Government of the Republic of China agrees to the joint use by the two countries of Port Arthur as a naval base.

### *Article II*

The precise boundary of the area provided in Article I is described in the Annex and shown in the map (Annex 1).

### *Article III*

The High Contracting Parties agree that Port Arthur, as an exclusive naval base, will be used only by Chinese and Soviet military and commercial vessels.

There shall be established a Sino-Soviet Military Commission to handle the matters of joint use of the above-mentioned naval base. The Commission shall consist of two Chinese and three Soviet representatives. The Chairman of the Commission shall be appointed by the Soviet side and the Vice Chairman shall be appointed by the Chinese side.

### *Article IV*

The Chinese Government entrusts to the Soviet Government the defence of the naval base. The Soviet Government may erect at its own expense such installations as are necessary for the defence of the naval base.

### *Article V*

The Civil Administration of the whole area will be Chinese. The leading posts of the Civil Administration will be appointed by the Chinese Government taking into account Soviet interests in the area.

The leading posts of the civil administration in the city of Port Arthur are appointed and dismissed by the Chinese Government in agreement with the Soviet military command.

The proposals which the Soviet military commander in that area may address to the Chinese civil administration in order to safeguard security and defence will be fulfilled by the said administration. In cases of disagreement, such cases shall be submitted to the Sino-Soviet military commission for consideration and decision.

### *Article VI*

The Government of U.S.S.R. have the right to maintain in region mentioned in Article II, their army, navy and air force and to determine their location.

### *Article VII*

The Government of the U.S.S.R. also undertakes to establish and keep up lighthouses and other installations and signs necessary for the security of navigation of the area.

### *Article VIII*

After the termination of this agreement all the installations and public property installed or constructed by the U.S.S.R. in the area shall revert without compensation to the Chinese Government.

### *Article IX*

The present agreement is concluded for thirty years. It comes into force on the day of its ratification.

In faith whereof the plenipotentiaries of the High Contracting Parties have signed the present agreement and affixed thereto their seals. The present agreement is made in two copies, each in the Russian and Chinese language, both texts being authoritative.

Done in Moscow, August 14, 1945, corresponding to the 14th day of the 8th month of the 34th year of the Chinese Republic.

THE PLENIPOTENTIARY OF THE PRESIDIUM OF THE SUPREME SOVIET OF THE U.S.S.R.

THE PLENIPOTENTIARY OF THE PRESIDENT OF THE NATIONAL GOVERNMENT OF THE REPUBLIC OF CHINA.

## APPENDIX TO "AGREEMENT ON PORT ARTHUR" SIGNED IN MOSCOW ON AUGUST 14, 1945 [1]

The territory of the area of the naval base provided for by paragraph II of the Agreement on Port Arthur is situated south of the line which begins on the west coast of Liaotung Peninsula—south of Housantaowan—and follows a general easterly direction across Shihe Station and the point of Tsoukiachutse to the east coast of the same peninsula, excluding the town of Dalny (Dairen).

All the islands situated in the waters adjoining the west side of the area on Liaotung Peninsula established by the Agreement, and south of the line passing through the points 39°00′ North latitude, 120°49′ East longitude; 39°20′ North latitude, 121°31′ East longitude, and beyond in a general northeasterly direction along the axis of the fairway leading to port Pulantien to the initial point on land, are included in the area of the naval base.

All the islands situated within the waters adjoining the eastern part of the area on Liaotung Peninsula and south of the line passing from the terminal point on land in an easterly direction towards the point 39°20′ North latitude, 123°08′ East longitude, and farther southeast through the point 39°00′ North latitude, 123°16′ East longitude, are included in the area. (See attached map,[2] scale 1 : 500,000.)

The boundary line of the district will be demarcated on the spot by a mixed Soviet-Chinese Commission. The Commission shall establish the boundary posts and, when need arises, buoys on the water, compile a detailed description of this line, enter it on a topographical map drawn to the scale of 1 : 25,000 and the water boundary on a naval map drawn to the scale of 1 : 300,000.

The time when the Commission shall start its work is subject to special agreement between the parties.

Descriptions of the boundary line of the area and the maps of this line compiled by the above Commission are subject to approval by both Governments.

W. S. V. M.

## AGREEMENT REGARDING RELATIONS BETWEEN THE CHINESE ADMINISTRATION AND THE COMMANDER-IN-CHIEF OF THE SOVIET FORCES AFTER THE ENTRY OF SOVIET TROOPS INTO THE "THREE EASTERN PROVINCES" OF CHINA DURING THE PRESENT JOINT MILITARY OPERATIONS AGAINST JAPAN

The President of the National Government of China and the Presidium of the Supreme Council of the Union of Soviet Socialist Republics, desirous that relations between the Chinese Administration and the Commander-in-Chief of the Soviet forces after the entry of Soviet troops into the "Three Eastern Provinces" of China during the present joint military operations against Japan should be governed by the spirit of friendship and alliance existing between the two countries, have agreed on the following:

1. After the Soviet troops enter the "Three Eastern Provinces" of China as a result of military operations, the supreme authority and responsibility in all matters relating to the prosecution of the war will be vested, in the zone of operations for the time required for the operations, in the Commander-in-chief of the Soviet forces.

2. A Chinese National Government representative and staff will be appointed for the recovered territory, whose duties will be:

(*a*) To establish and direct, in accordance with the laws of China, an administration for the territory cleared of the enemy.

(*b*) To establish the cooperation between the Chinese armed forces, both regular and irregular, and the Soviet forces in recovered territory.

(*c*) To ensure the active cooperation of the Chinese administration with the Commander-in-chief of the Soviet forces and, specifically, to give the local authorities directions to this effect, being guided by the requirements and wishes of the Commander-in-chief of the Soviet forces.

---

[1] As printed in the Moscow *News* of Aug. 29, 1945.

[2] Reproduced on pages 202 and 203.

3. To ensure contact between the Commander-in-chief of the Soviet forces and the Chinese National Government representative a Chinese military mission will be appointed to the Commander-in-chief of the Soviet forces.

4. In the zones under the supreme authority of the Commander-in-chief of the Soviet forces, the Chinese National Government administration for the recovered territory will maintain contact with the Commander-in-chief of the Soviet forces through the Chinese National Government representative.

5. As soon as any part of the liberated territory ceases to be a zone of immediate military operations, the Chinese National Government will assume full authority in the direction of public affairs and will render the Commander-in-chief of the Soviet forces every assistance and support through its civil and military bodies.

6. All persons belonging to the Soviet forces on Chinese territory will be under the jurisdiction of the Commander-in-Chief of the Soviet forces. All Chinese, whether civilian or military, will be under Chinese jurisdiction. This jurisdiction will also extend to the civilian population on Chinese territory even in the case of offences against the Soviet armed forces, with the exception of offences committed in the zone of military operations under the jurisdiction of the Commander-in-chief of the Soviet forces, such cases coming under the jurisdiction of the Commander-in-chief of the Soviet forces. In disputable cases the question will be settled by mutual agreement between the Chinese National Government representative and the Commander-in-chief of the Soviet forces.

7. With regard to currency matters after the entry of Soviet troops into the "Three Eastern Provinces" of China, a separate agreement shall be reached.

8. The present Agreement comes into force immediately upon the ratification of the Treaty of Friendship and Alliance between China and the U.S.S.R. signed this day. The Agreement has been done in two copies, each in the Chinese and Russian languages. Both texts are equally valid.

Date . . . . . . . . . . .

ON THE AUTHORIZATION OF THE NATIONAL GOVERNMENT OF THE REPUBLIC OF CHINA.

ON THE AUTHORIZATION OF THE GOVERNMENT OF THE UNION OF SOVIET SOCIALIST REPUBLICS.

## AGREEMENT BETWEEN THE REPUBLIC OF CHINA AND THE U.S.S.R. CONCERNING THE CHINESE CHANGCHUN RAILWAY.

The President of the Republic of China and the Presidium of the Supreme Council of the U.S.S.R., desiring to strengthen the friendly relations and economic bonds between the two countries on the basis of the full observation of the rights and interests of each other, have agreed as follows:

### *Article I*

After the Japanese armed forces are driven out of the Three Eastern Provinces of China the main trunk line of the Chinese Eastern Railway and the South Manchurian Railway from Manchuli to Suifenho and from Harbin to Dairen and Port Arthur united into one railway under the name "Chinese Changchun Railway" shall be in joint ownership of the U.S.S.R. and the Republic of China and shall be operated by them jointly.

There shall be joint ownership and operation only of those lands acquired and railway auxiliary lines built by the Chinese Eastern Railway during the time of Russian and joint Sino-Soviet administration and by the South Manchurian Railway during the time of Russian administration and which are designed for direct needs of these railways as well as the subsidiary enterprises built during the said periods and directly serving these railways. All the other railway branches, subsidiary enterprises and lands shall be in the complete ownership of the Chinese Government.

The joint operation of the aforementioned railway shall be undertaken by a single management under Chinese sovereignty and as a purely commercial transportation enterprise.

### *Article II*

The High Contracting parties agree that their joint ownership of the railway shall be in equal shares and shall not be alienable in whole or in part.

### *Article III*

The High Contracting parties agree that for the joint operation of the said railway the Sino-Soviet Company of the Chinese Changchun Railway shall be formed. The Company shall have a Board of Directors to be composed of ten members of whom five shall be appointed by the Chinese Government and five by the Soviet Government. The Board of Directors shall be in Changchun.

### *Article IV*

The Chinese Government shall appoint one of the Chinese Directors as President of the Board of Directors and one as the Assistant President. The Soviet Government shall appoint one of the Soviet Directors as Vice-President of the Board of Directors, and one as the Assistant Vice-President. Seven persons shall constitute a quorum. When questions are decided by the Board, the vote of the President of the Board of Directors shall be counted as two votes.

Questions on which the Board of Directors cannot reach an agreement shall be submitted to the Governments of the Contracting Parties for consideration and settlement in an equitable and friendly spirit.

### *Article V*

The Company shall establish a Board of Auditors which shall be composed of six members of whom three are appointed by the Chinese Government and three appointed by the Soviet Government. The Chairman of the Board of Auditors shall be elected from among the Soviet Auditors, and Vice-Chairman from among the Chinese auditors. When questions are decided by the Board the vote of the Chairman shall be counted as two votes. Five persons shall constitute a quorum.

### *Article VI*

For the administration of current affairs the Board of Directors shall appoint a manager of the Chinese Changchun Railway from among Soviet citizens and one assistant manager from among Chinese citizens.

### *Article VII*

The Board of Auditors shall appoint a General-Comptroller from among Chinese citizens, and an assistant General-Comptroller from among Soviet citizens.

### *Article VIII*

The Chiefs and Assistant Chiefs of the various departments, Chiefs of sections, station masters at important stations of the railway shall be appointed by the Board of Directors. The Manager of the Railway has right to recommend candidates for the above-mentioned posts. Individual members of the Board of Directors may also recommend such candidates in agreement with the Manager. If the Chief of a department is a national of China, the Assistant Chief shall be a national of the Soviet Union, and vice versa. The appointment of the Chiefs and assistant chiefs of departments and Chiefs of sections and station masters shall be made in accordance with the principle of equal representation between the nationals of China and nationals of the Soviet Union.

### *Article IX*

The Chinese Government will bear the responsibility for the protection of the said Railway.

The Chinese Government will also organize and supervise the railway guards who shall protect the railway buildings, installations and other properties and freight from destruction, loss and robbery, and shall maintain the normal order on the railway. As regards the duties of the police in execution of this Article, they will be determined by the Chinese Government in consultation with the Soviet Government.

### *Article X*

Only during the time war against Japan the railway may be used for the transportation of Soviet troops. The Soviet Government has the right to transport by the above-mentioned railway for transit purpose military goods in sealed cars without customs inspection. The guarding of such military goods shall be undertaken by the railroad police and the Soviet Union shall not send any armed escort.

### *Article XI*

Goods for through transit and transported by the Chinese Changchun Railway from Manchuli to Suifenho or vice versa and also from Soviet territory to the ports of Dairen and Port Arthur or vice versa shall be free from Chinese Customs duties or any other taxes and dues, but on entering Chinese territory such goods shall be subject to Chinese Customs inspection and verification.

### *Article XII*

The Chinese Government shall ensure, on the basis of a separate agreement, that the supply of coal for the operation of the railway will be fully secured.

### *Article XIII*

The railway shall pay taxes to the Government of the Republic of China the same as are paid by the Chinese state railways.

### *Article XIV*

Both Contracting Parties agree to provide the Board of Directors of the Chinese Changchun Railway with working capital the amount of which will be determined by the Statute of the Railway.

Profits and losses in exploitation of the railway shall be equally divided between the Parties.

### *Article XV*

For the working out in Chungking of the Statutes of joint operation of the railway the High Contracting Parties undertake within one month of the signing of the present Agreement, to appoint their representatives—three representatives from each Party. The Statute shall be worked out within two months and reported to the two Governments for their approval.

### *Article XVI*

The determination, in accordance with the provisions in Article I, of the properties to be included in the joint ownership and operations of the railway by China and U.S.S.R. shall be made by a Commission to be composed of three representatives each of the two Governments. The Commission shall be constituted in Chungking within one month after the signing of the present Agreement and shall terminate its work within three months after the joint operation of the railway shall have begun.

The decision of the Commission shall be reported to the two Governments for their approval.

### *Article XVII*

The term of this present Agreement shall be thirty years. After the expiration of the term of the present Agreement, the Chinese Changchun Railway with all its properties shall be transferred without compensation to the ownership of the Republic of China.

### *Article XVIII*

The present Agreement shall come into force from the date of its ratification.

Done in Moscow, August 14th, 1945, corresponding to the 14th day of the 8th month of the 34th year of the Chinese Republic, in two copies, each in the Russian and Chinese languages, both texts being equally authoritative.

THE PLENIPOTENTIARY OF
THE PRESIDIUM OF
THE SUPREME SOVIET
OF THE U.S.S.R.

**THE PLENIPOTENTIARY OF**
**THE PRESIDENT OF**
**THE NATIONAL GOVERNMENT OF THE REPUBLIC OF CHINA.**

# SUMMARY LIST OF INDUSTRIAL EQUIPMENT AND MATERIAL REMOVED FROM MANCHURIA BY THE SOVIET OCCUPATION FORCES

This document was prepared by the Northeastern Economic Commission of the Chinese Nationalist Government at Mukden during June of 1946. This data was among the many sources of information used in the preparation of the Pauley Mission's appraisal of removals and damage to Manchuria's industrial plants.

While, in many cases, the Chinese estimates varied up or down from the Pauley Mission's ultimate appraisals, the data in this document was found to be generally useful.

## NOTES

1. Electrical power generation and transmission were controlled during Japanese occupation by one organisation from which fairly complete records are available. The figures in the following table relating to the loss of electrical power are therefore quite accurate and complete.

2. Owing to the removal of electrical power plants, many otherwise good plants cannot operate or can only operate on a fraction of their capacity. The actual reduction in production is therefore very much greater than the figures directly due to loss of equipment as given in these lists.

3. Many of the larger coal mines are taken over by the Ministry of Economic Affairs. Most of the old records are available, hence the losses recorded in the list for coal industry are also accurate.

4. The liquid fuel industry in North-Eastern China is largely concentrated in the area already taken over by Government troops. The same is true with the iron and steel industry. Data regarding these industries as recorded in these lists are also fairly accurate.

5. For the other industries, damage has been severe. In cases where records have been lost, figures given in these lists are based on no sounder basis than approximate estimation by former Japanese responsible officers of the firms concerned. Some error is thus likely to exist in these lists. Also, some discrepancy may exist in the values (in U.S. dollars) of equipment and materials removed owing to differences in the rate of exchange used and differences in time of purchase.

6. Small and unimportant firms have not been included in these lists.

7. Data for firms and plants located in Communist occupied areas are not complete.

8. For details of the losses, there are separate detailed lists available for reference.

# CONTENTS

1. ELECTRICAL POWER
2. COAL INDUSTRY
3. LIQUID FUEL INDUSTRY
4. IRON & STEEL INDUSTRY
5. NON-FERROUS METAL INDUSTRY
6. MACHINERY INDUSTRY
7. TRANSPORTATION EQUIPMENT INDUSTRY
8. ELECTRICAL MANUFACTURING INDUSTRY
9. CHEMICAL INDUSTRY
10. TEXTILE INDUSTRY
11. ORDNANCE

717231 O - 46 - 21

# I. ELECTRICAL POWER

## Manchuria Electrical Power Co.

No. 1

| Name of Plant | Locality | Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops<br>Capacity and No. of Unit | Equipments Removed by Soviet Troops<br>% of Original Equipment | Materials Removed by Soviet Troops<br>Approx Value U.S.$ | Decrease in Productive Capacity Due to Removal of Equipment.% | Remarks |
|---|---|---|---|---|---|---|---|
| 1. Fushun Power Station<br>撫順發電所 | Fushun | 10,000 KW x 1<br>12,500 " x 2<br>25,000 " x 4#<br>50,000 " x 3 | 10,000 x 1<br>-<br>25,000 x 2<br>50,000 x 3 | 100<br>0<br>50<br>100 | | 75 | # 1-25,000 KW unit is beyond repair. |
| 2. Fushin Power Station<br>阜新發電所 | Fushin | 27,000 KW x 2<br>53,000 " x 4 | 27,000 x 2<br>53,000 x 4 | 100<br>100 | | 100 | Including 2 unit not erected. |
| 3. Anshan Power Station<br>鞍山發電所 | Anshan | 18,000 KW x 2<br>25,000 " x 1<br>12,000 " x 1# | 18,000 x 1<br>25,000 x 1<br>- | 50<br>100 | | 50 | # Beyond repair |
| 4. Kanchingtse<br>甘井子發電所 | Dairen | 25,000 KW x 3<br>4,000 " x 2#<br>15,750 " x 2# | 25,000 x 2<br>- | 67 | | 50 | # Beyond repair |
| 5. Kaiyuan<br>開原發電所 | Kaiyuan | 3,500 KW x 1 | 3,500 x 1 | 100 | | 100 | |
| 6. Penhsihu<br>本溪湖發電所 | Penhsihu | 20,000 KW x 3<br>6,000 " x 1<br>14,000 " x 2 | 20,000 x 3<br>6,000 x 1 | 100<br>100 | | 70 | Including 1 unit not erected. |
| 7. Fengman<br>豐滿水電廠 | Fengman | 70,000 KW x 5 | 70,000 x 5 | 70 | | 70 | Including 3 unit not erected |

## I. ELECTRIC[illegible] POWER

## Manchuria Electrical Power Co.

No. 2

| Name of Plant | Locality | Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops | | Materials Removed by Soviet Troops | Decrease in Productive Capacity Due to Removal of Equipment.% | Remarks |
|---|---|---|---|---|---|---|---|
| | | | Capacity and No. of Nuit | % of Original Equipment | Approx Value U.S.$ | | |
| 8. Suifeng (This plant is a joint concern for both China and Korea.) | Suifeng | 10 ,000 KW x 7 | 100,000 x 3 | 43 | | 43 | There were altogether 7 unit of 100,000 KW but 1 unit of 50 Cy. has been damaged before the surrender of Japan. 2- 50 Cy. and 1- 60/50 Cy. unit are taken away. Ther were specifically for us in N.E. China. These presumably were provided for us both inChina and Korea. Specifically for use in Korea, therefore not included in the total for N.E. China. |
| | P.S. | 200,000 KW (50 Cy.) ......... | | | | | |
| | | 200,000 KW ( 50/60 Cy.) ......... | | | | | |
| 水豐水電廠 | | 200,000 KW (6- Cy.) ......... | | | | | |
| 9. Tienhsiu | Tienhsiu | 1,500 KW x 2 | | | | | Destroyed by war. |
| [illegible]付發電所 | | | | | | | |
| 10. Pai Piao | Pai Piao | 15,000 KW x 1 | | | | | Beyond repair |
| 化票發電所 | | | | | | | |
| 11. Ertaochuang | Ertaochuang | (15,000 KW x 2<br>( 7,500 " x 1 | 15,000 x 2 }<br>7,500 x 1 } | 100 | N I L | 100 | |
| 二道江發電所 | | | | | | | |
| 12. Tiechangtze | Tiechangtze | 1,000 KW x 1 | | | | | Destroyed by war |
| [illegible] 莊 子 | | | | | | | |
| 13. [illegible] | [illegible] | [illegible] | | | | | |
| 西安發電所 | | | | | | | |

## I. ELECTRICAL POWER

### Manchuria Electrical Power Co.

No. 3

| Name of Plant | Locality | Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops | | Materials Removed by Soviet Troops | Decrease in Productive Capacity Due to Removal of Equipment.% | Remarks |
|---|---|---|---|---|---|---|---|
| | | | Capacity and No. of Unit | % of Original Equipment. | Approx Value U.S.$ | | |
| 14. Tunliao<br>通遼 | Tunliao | ( 1,400 KW x 1<br>( 500 " x 1<br>( 200 " x 1 | | | | | Destroyed by war |
| 15. Changchun<br>長春發電所 | Changchun | (15,000 KW x 1<br>(14,000 " x 1<br>( 7,000 " x 2<br>( 6,000 " x 1 | | | | | |
| 16. Chiaoho<br>蛟河發電所 | Chiaoho | ( 3,000 KW x 3<br>( 1,000 " x 1<br>( 880 " x 1 | | | | | Destroyed by war |
| 17. Lungching<br>龍井發電所 | Lungching | ( 5,000 KW x 1<br>( 4,000 " x 1 | | | | | Destroyed by war |
| 18. Kunchun<br>琿春發電所 | Kunchun | 2,800 KW x 2 | | | | | Destroyed by war |
| 19. Tunnin<br>東寧發電所 | Tunnia | ( 1,500 KW x 1<br>( 1,200 " x 1<br>( 1,600 " x 1 | | | | | Destroyed by war |
| 20. Chinpohu<br>鏡 泊 湖 | Chinpohu | 12,000 KW x 2 | | | | | Destroyed by war |
| 21. Mutanchiang<br>牡丹江發電所 | Mutanchiang | ( 4,200 KW x 1<br>( 3,000 " x 1<br>( 2,320 " x 1 | | | | | Destroyed by war |
| 22. Suifenho<br>綏芬河發電所 | Suifenho | ( 1,000 KW x 1<br>( 600 KW x 1 | | | | | Destroyed by war |

1. ELECTRICAL POWER

**Manchuria Electrical Power Co.**

No. 4

| Name of Plant | Locality | Capacity before Aug.15,1945 | Equipment Removed by Soviet Troops | | Materials Removed by Soviet Troops | Decrease in Productive Capacity Due to Removal of Equipment.% | Remarks |
|---|---|---|---|---|---|---|---|
| | | | Capacity and No. of Unit | % of Original Equipment | Approx Value U.S.$ | | |
| 23. Chining<br>雞寧發電所 | Chining | 15,000 KW x 3 | | | | | Destroyed by war.<br>1 unit is not erected. |
| 24. Titao<br>滴道發電所 | Titao | ( 5,000 KW x 1<br>( 880 " x 1 | | | | | Destroyed by war. |
| 25. Chiencheng<br>千振發電所 | Chiencheng | 1,500 KW x 2 | | | | | Destroyed by war. |
| 26. Chiamussu<br>佳木斯發電所 | Chiamussu | 7,500 KW x 3 | | | | | Destroyed by war. |
| 27. Hukan<br>鶴岡發電所 | Hukan | 1,500 KW x 3 | | | | | Destroyed by war. |
| 28. Sunwoo<br>孫吳發電所 | Sunwoo | ( 400 KW x 1<br>( 800 " x 2<br>( 4,500 " x 1 | | | | | Destroyed by war |
| 29. Peian<br>北安發電所 | Peian | ( 1,500 KW x 2<br>( 880 " x 1 | | | | | Destroyed by war. |
| 30. Chichihaer<br>齊々哈爾發電所 | Chichihaer | 2,800 KW x 3 | | | | | Destroyed by war. |
| 31. Harbin<br>哈爾濱發電所 | Harbin | ( 2,000 KW x 2<br>(k4,000 " x 2<br>( 6,000 " x 1 | | | | | |

1. E[illegible]

Manchuria Electrical [illegible] Co.

| Name of Plant | Locality | Capacity before Aug.15,1945 | Equipments Removed by [illegible]<br>Capacity and No. of unit | Equipments Removed by [illegible]<br>% of original Equipment | Materials Removed by Soviet Troops<br>Value U.S.$ | Decrease in productive capacity [illegible] | Remarks |
|---|---|---|---|---|---|---|---|
| 32. Fuyü<br>扶餘發電所 | F[illegible] | ( [illegible] Kw x 1<br>( [illegible] " x 1<br>( [illegible] " x 1 | | | | | Destroyed by war. |
| 33. Paich[illegible]<br>白城子發電所 | [illegible] | 1,500 Kw x 2 | | | | | Destroyed by war |
| 34. [illegible]<br>雙頭山發電所 | Shantoshan | (1,500 Kw x 2<br>(3,000 " x 1 | | | | | Destroyed by war |
| 35. Chalainoer<br>札[illegible]諾發電所 | Chalainoer | (1,400 Kw x 1<br>(1,[illegible] " x 1 | | | | | Destroyed by war. |
| 36. Hailar<br>海 [illegible]發電所 | Hailar | (1,500 Kw x 5<br>( 640 " x 1 | | | | | Destroyed by war. |
| 37. Mukden Go-down Electrical Co.<br>[illegible]材料庫 | Mukden | | | | Y<br>[illegible] | | |
| 38. Ch[illegible]<br>[illegible]材料分庫 | Changchun<br>Dairen<br>Anshan | | | | | | Reported damaged, but no detailed information available. |

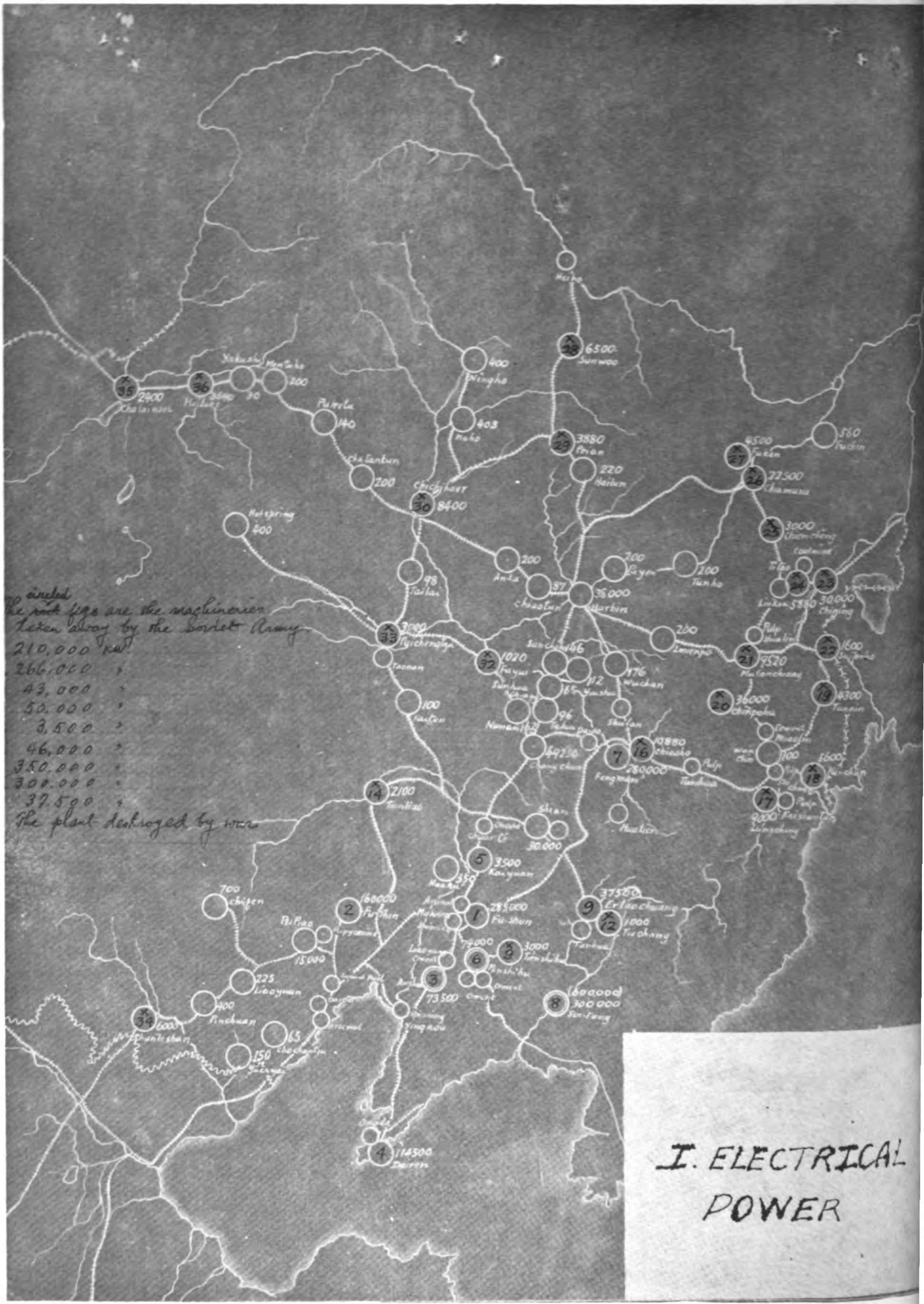
## 1. ELECTRICAL POWER

**Manchuria Electrical Power Co.**

No. 6

| | | |
|---|---|---|
| **T O T A L** | **1,999,450 KW** | 1,220,000 KW |
| **Installed** | 1,633,450 **KW** | |
| Unerected | 366,000 **KW** | |
| Plants destroyed by war and machines beyond repair. | | 311,700 **KW** |
| Total capacity that can be operated | 467,750 **KW** | |
| Total capacity of transformer taken away by Soviet Army. | | 730,000 **KVA** |
| Total capacity of boiler taken away by Soviet Army. | | 2,550 **T/H** |

# I. ELECTRICAL POWER


Heiho
28 6500 Sunwoo
35 2400 Chalainoor
36 3000 Hailar
Yakeshi 70
Mentaho 200
Pureta 140
Chalantun 200
400 Ningho
403 Noho
29 3880 Peian
220 Hailun
30 8400 Chichihaer
Hotspring 400
200 Anta
98 Tailai
37 Chiaotun
36000 Harbin
200 Puyen
200 Tunho
560 Fuchin
27 4500 Fuchin
26 22500 Chiamussu
25 3000 Chienchêng
Coalmine
Tilao
24
23
Linkou 5850
30000 Chiping
Pulp Hualin
22 1600 Suifenho
21 9520 Mutanchiang
200 Imienpo
33 3000 Pyichengtzu
Taonan
32 1020 Fuyu
100 Kaitun
Sunchang 46
112 Yushu
65
Sunhua
96
Numan 102
Taihau
176 Wuchan
Shulan
20 36000 Chinpohu
19 4300 Tumen
16 10880 Chiaoho
7 280000 Fengman
Pulp Tunhua
49230 Changchun
Cement Mingyen
Wanchin 100
Pulp
18 5600 Hunchun
17 9300 Lungching
Pulp
Kaishantun
14 2100 Tungliao
Shian
30,000
Chuan Cr
Huatien
5 3500 Kaiyuan
350
9 37500 Erhtaochiang
12 1000 Tuchang
Tunhua
700 chifen
2 160000 Fushin
PeiPiao
Fuyyaming
15,000
1 285000 Fu-shun
74000
6 Penshihu
3 3000 Tienshihu
Cement
3 73500 Anshan
8 1600000 300000 Su-fong
225 Liaoyuan
400 Pinchuan
34 6000 Shanteshan
65 Chochenfin
150 Yuenyang
Yingkou
Onoda
4 114500 Dairen

The ~~red~~ circled figs are the machineries taken away by the Soviet Army.
210,000 kw
266,000 〃
43,000 〃
50,000 〃
3,500 〃
46,000 〃
350,000 〃
300,000 〃
37,500 〃
The plant destroyed by war

## 2. COAL INDUSTRY

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 Tons | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| (A) South Manchuria Railway Co. Fushun Coal Mine.<br>南滿洲鐵道撫順煤礦 | Fushun | Coal | 4,835,000 | 786 Machines & parts | 50 | 3,544,616 | 568,000 (Including 550,000 T. of coal) | 5,300,000 | 60 | This mine has also an oil distillation plant producing liquid fuels, ammonium sulphate, etc. See list for "Liquid Fuel and Chemical Ind." |
| " | Yentai<br>煙臺 | Coal | 306,038 | 55 Machines & parts. | 10 | 35,150 | 3,838 | 223,340 | 20 | No output since March 16, 1946. |
| " | Chiaoho<br>蛟河 | Coal | 1,241,649 |  | UNKNOWN |  |  |  |  | Daily output of 800 tons until the middle of Feb. 1946. Output decreased to 300 tons daily in the end of the same month. |
| " | Laotaokow<br>老頭溝 | Coal | 164,807 |  | UNKNOWN |  |  |  |  | Mining has been stopped since the entry of Soviet troops. No further information is available since then. |
| " | Wafantien<br>瓦房店 | Coal | 33,266 |  | UNKNOWN |  |  |  |  | Mining has been suspended since March 1946. |
| " | Fuchin<br>富錦 | Coal | 84,466 |  | UNKNOWN |  |  |  |  | Mining has been discontinued since the entry of Soviet troops. No further information is available. |

## 2. COAL INDUSTRY

No. 2.

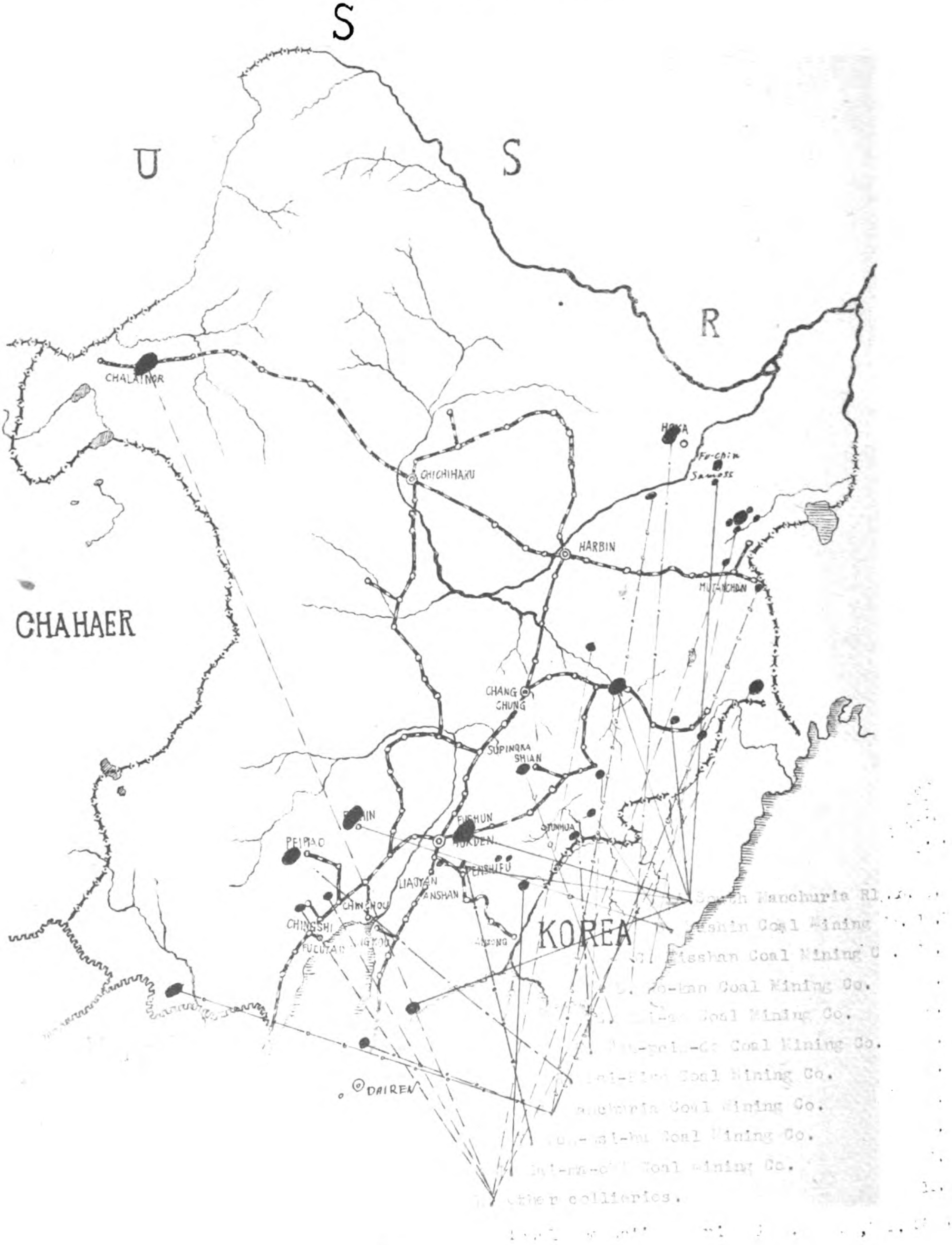
| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 Tons | Equipments Removed by Soviet Troops | | | Materials Removed by Soviet Troops | | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ | | |
| B) Fushin Coal Mining Co.<br>阜新炭礦 | Fushin | Coal | 4,600,000 | 24,089 Tons | 80 | 5,759,790 | 24,326 | 5,137,600 | 95 | |
| C) Misshan Coal Mining.<br>密山炭礦 | Misshan | Coal | 2,950,000 | | U N K N O W N | | | | | No information available since Aug. 1945. |
| D) Ho-kan Coal Mining Co.<br>鶴岡炭礦 | Ho-kan | Coal | 1,970,000 | | U N K N O W N | | | | | No information available since Aug. 1945. |
| E) Shi-an Coal Mining Co.<br>西安炭礦 | Shi-an | Coal | 1,900,000 | This mine has just been taken over by Central Government; reports have not yet arrived. | | | | | | Output in March 1946, 1,000 tons a day. |
| F) Ton-pein-do Coal Mining Co.<br>東邊道炭礦 | Ton-pein-do | Coal | 1,530,000 | | U N K N O W N | | | | | No information available since Aug. 1945. |
| G) Pei-piyo Coal Mining Co.<br>北票炭礦 | Pei-piyo | Coal | 1,250,000 | | | N I L | | | 90 | This decrease in productive capacity is due to the removal of electrical power. |
| H) Manchuria Coal Mining Co.<br>滿洲炭礦 | Fu-chow<br>Ho-lung<br>San-sin<br>Sin-lung | Coal | 1,030,000 | | U N K N O W N | | | | | No information available since Aug. 1945. |

## 2. COAL INDUSTRY

No. 3.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 Tons | Equipments Removed by Soviet Troops | | | Materials Removed by Soviet Troops | | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ | | |
| I) **Manshu Iron Co., Ltd.** Penhsihu Works Coal Mine.<br>本溪湖炭礦 | Penhsihu | Coal | 951,000 | .. | .. | .. | .. | .. | 60 | Loss of equipments and materials included in figure ~~in~~ for Manshu Iron Co., Ltd. (b)Penhsihu Works. See Iron & Steel Industry. |
| J) Saimachi Collieries.<br>賽馬集炭礦 | Saimachi | Coal | 450,000 | | U | N K' | N O | W N | | No information available since Aug. 1945 |
| K) Other Collieries. | Nan-piyo )<br>Ching-si ) | | 140,000 | 410 Tons | 40 | 65,162 | 14,224 | 182,319 | 60 | |
| | hun-chun<br>Chalainoer<br>Muling<br>Hsulan | | 550,000<br>400,000<br>450,000<br>215,000 | | U | N K | N O | W N | | No information available since Aug. 1945 |
| | and some )<br>other 8 )<br>small pits) | | 1,441,000 | | | | | | | |

# 2. COAL INDUSTRY



U S S R
CHAHAER
KOREA
CHALAINOR
CHICHIHARU
HARBIN
HOKA
Fu-chin
Sanoss
MUTANCHAN
CHANG CHUNG
SUPINGKA
SHIAN
FUHSIN
PEIPIAO
FUSHUN
MUKDEN
TUNHUA
PENSHIFU
LIAOYAN
ANSHAN
CHINCHOU
CHINGSHI
FUCUTAI
YINGKOU
ANTUNG
DAIREN
South Manchuria Rl.
...shin Coal Mining
...Eisshan Coal Mining C
...o-kan Coal Mining Co.
...Coal Mining Co.
...-pei-C Coal Mining Co.
...Coal Mining Co.
...nchuria Coal Mining Co.
...-si-hu Coal Mining Co.
...Coal Mining Co.
...other collieries.

## 3. LIQUID FUEL INDUSTRY

No. 1.

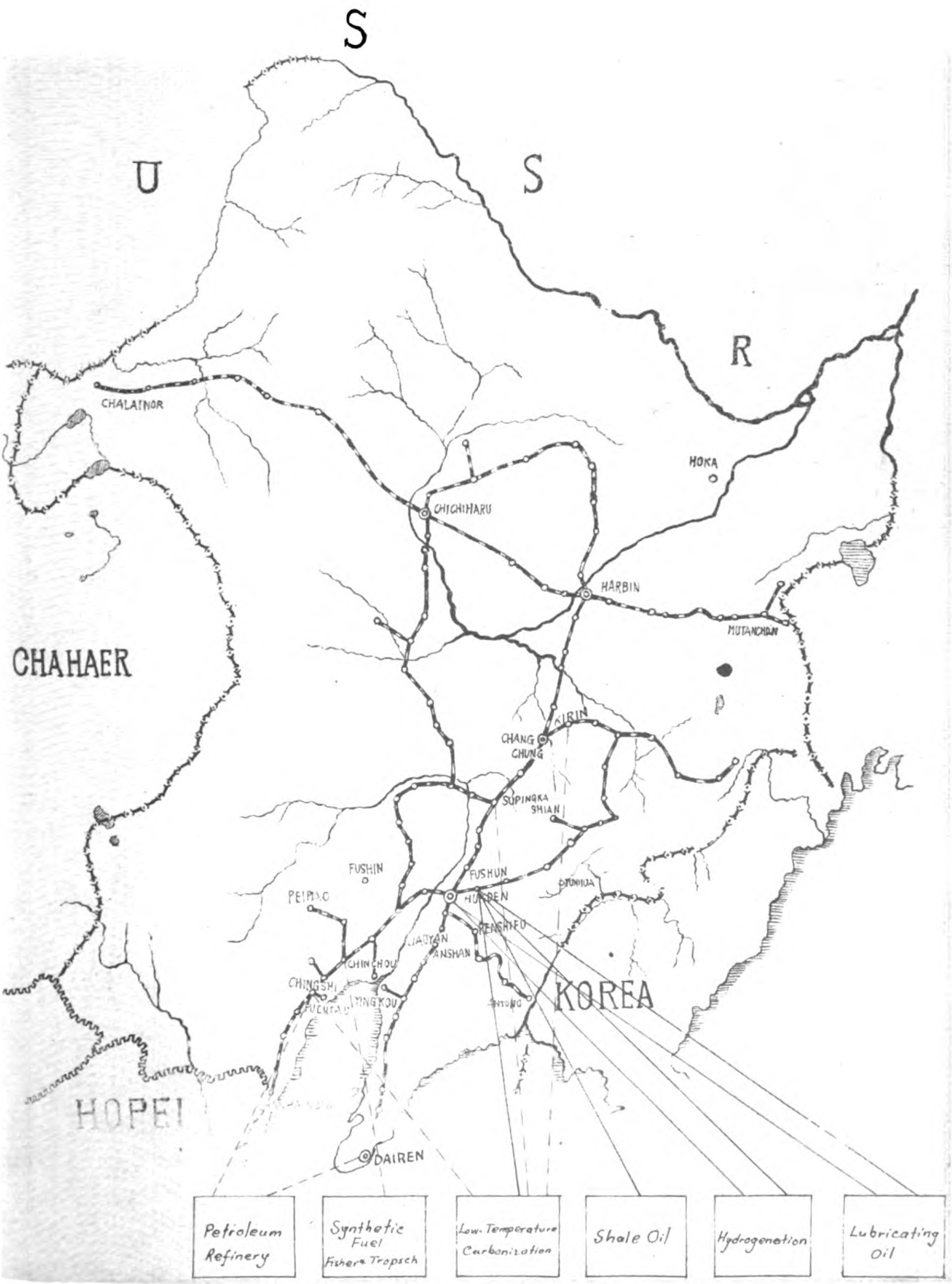
| Name of Firm | Locality | Raw Materials Used | Products | Annual Capacity before Aug. 15, 1945. Tons | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value. U.S.$ |  |  |
| 1. Japanese Army 2nd Fuel Factory<br>陸軍第二燃料廠 (945部隊) | Chingsi | Petroleum | Gasoline<br>Lubricating oil | 180,000#<br>540 | 3,000 Machines & parts | 30 | 3,131,344 | 25,000 | 2,369,360 | 50 | #This figure indicates crude oil used |
|  |  | Coal | Tar | 6,000 |  |  |  |  |  |  |  |
| 2. Manshu Petroleum Refining Co.<br>滿洲石油會社 大連燃料廠 | Dairen | Petroleum | Gasoline | 150,000 Crude oil |  |  | U N K N O W N |  |  |  | No information available since Feb.1946 |
| 3. Synthetic Fuel Co.,Ltd. Fischer - Tropsch<br>合成燃料廠 | Chinchou | Coal | Light and | 10,000 | 1,820 Tons | 50 | 104,666 | 7,056 | 204,160 | 60 | This work has had no regular production since its establishment. |
| 4. Japanese Army 1st Fuel Factory.<br>陸軍第一燃料廠 | Ssuping | Coal | Low temperature tar | 6,000 |  |  | U N K N O W N |  |  |  | No information available since Aug.1945 |
| 5. South Manchurian Mining Co.<br>南滿礦業會社 | Dashechou | Coal | Low temperature tar | 6,000 |  |  | U N K N O W N |  |  |  | No information available since Aug.1945 |
| 6. Manshu Artificial Petroleum Co. Kirin Plant.<br>滿洲人造石油會社 吉林工場 | Kirin | Coal | Methanol<br>Low temperature tar. | 15,000<br>7,000 |  |  | U N K N O W N |  |  |  | No information available since Aug.1945 |

## 3. LIQUID FUEL INDUSTRY

No. 2.

| Name of Plant | Locality | Raw Materials Used | Products | Annual Capacity before Aug. 15, 1945 Tons | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 7. S.M.R.Co. Fushun Coal Mine Shale Oil Plant.<br>[illegible]式會社<br>[illegible]<br>撫順製油工場 | Fushun | Shale oil | No.1 Heavy oil<br>No.2 "<br>Gasoline<br>Lubricant.<br>Crude paraffin<br>Paraffin | 2,[illegible]70<br>50,603<br>3,280<br>3,200<br>28,226<br>3,440 | .. | .. | .. | .. | .. | 15 | This is a department belonging to Fushun Coal Mine. Loss of equipments & materials included in figure for Fushun Coal Mine. See list for "Coal Ind." |
| 8. [illegible] Research Institute for Coal Hydrogenation.<br>石炭液化研究所 | Mukden | Middle oil from coal tar | Aviation gasoline | 2,000 | 51 Machines & parts | 100 | 190,010 | 150 | 16,780 | 100 | All equipments are German made. |
| 9. Manshu Artificial Petroleum Co. Fushun Plant<br>[illegible]人造石油[illegible]工場 | Fushun | Middle oil from coal tar | Aviation gasoline<br>Motor gasoline | 1,650<br>1,470 | 500 | 70 | 51,677 | 1,200 | 79,000 | 100 |  |
| 10. S.M.R.Chemical Factory.<br>滿鐵化學工場 | Mukden | Shale oil paraffin | Synthetic super-heated cylinder oil | 1,000 | Nil | Nil | Nil | 2,000 | 3,500 | Nil |  |
| 11. S.M.R. Co. Fushun Coal Mine Chemical Works.<br>南滿洲[illegible]道株式會社<br>[illegible]化學工[illegible]所 | Fushun | Coal | Low temperature tar | 2,500 |  |  | N I L |  |  |  |  |

# 3. LIQUID FUEL INDUSTRY


U S S R
CHAHAER
HOPEI
KOREA
CHALAINOR
CHICHIHARU
HOKA
HARBIN
MUTANCHIAN
KIRIN
CHANG CHUNG
SUPINGKA
SHIAN
FUSHIN
PEIPIAO
FUSHUN
MUKDEN
TUNHUA
PENSHIFU
LIAOYAN
ANSHAN
CHINCHOU
CHINGSHI
HUCHTAO
YINGKOU
ANTONG
DAIREN
Petroleum Refinery
Synthetic Fuel Fisher-Tropsch
Low-Temperature Carbonization
Shale Oil
Hydrogenation
Lubricating Oil

## 4. IRON AND STEEL INDUSTRY

No. 1

| Name of Firm | Locality | Main Products | Annual Capacity before Aug. 15, 1945 Tons | Equipments Removed by Soviet Troops: Amount | % of Original Equipment | Value ¥ | Materials Removed by Soviet Troops: Amount Ton | Value ¥ | Rate in Productive Capacity due to Removal of Equipments | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. [illegible] Iron Co., Ltd. | | | | Tons | | | | | | |
| a) Anshan Works<br>[illegible]株式会社<br>[illegible] 山 工 [illegible] | Anshan | Iron ore<br>Coke<br>Pig iron<br>Steel ingots<br>Rolled steel products | [illegible],000)<br>[illegible],000)<br>[illegible],000)<br>1,330,000)<br>[illegible]) | 156,360 | 65 | 9[illegible],363,800 | 248,971 | [illegible]6,205,101 | [illegible] | |
| b) Penhsihu Works<br>同 上<br>本 渓 工 [illegible] | Penhsihu | Iron ore<br>Coal<br>Coke<br>Pig iron | 1,[illegible]00,000)<br>951,000)<br>5[illegible]0,000)<br>4[illegible],000) | 14,385 | 75 | [illegible] | | | [illegible] | Ore mines still in [illegible] hands. |
| 2. Penhsihu Special Steel Co., Ltd.<br>満洲[illegible]株式會社 | Penhsihu | Special steel bars | 4,[illegible] | 1,[illegible] Machines & parts | [illegible] | 1,[illegible] | | | [illegible] | |
| 3. Sumitomo Metallurgical Co., Ltd. | | | | | | | | | | |
| a) Mukden Works<br>満洲住友金属<br>工業株式會社<br>奉天製鋼所 | Mukden | Railroad tyres & wheels<br>Mining machinery | [illegible]6,460 | 1,245 Machines & parts | 80 | [illegible] | | 2,441,[illegible] | 6[illegible] | |
| b) Anshan Works<br>同 上<br>鞍山鋼管所 | Anshan | Seamless pipes | 56,[illegible] | 1,017 Machines & parts | 95 | 6,[illegible] | | 3,[illegible] | 1[illegible] | |
| 4. Shinko Metallurgical Co., Ltd.<br>満洲[illegible]<br>工業株式會社 | Anshan | Iron & steel castings, steel forgings | [illegible],89[illegible] | [illegible] Machines & parts | 3[illegible] | 7,3[illegible]6,2[illegible]0 | | 1[illegible],1[illegible] | 5[illegible] | |

## 4. IRON AND STEEL INDUSTRY

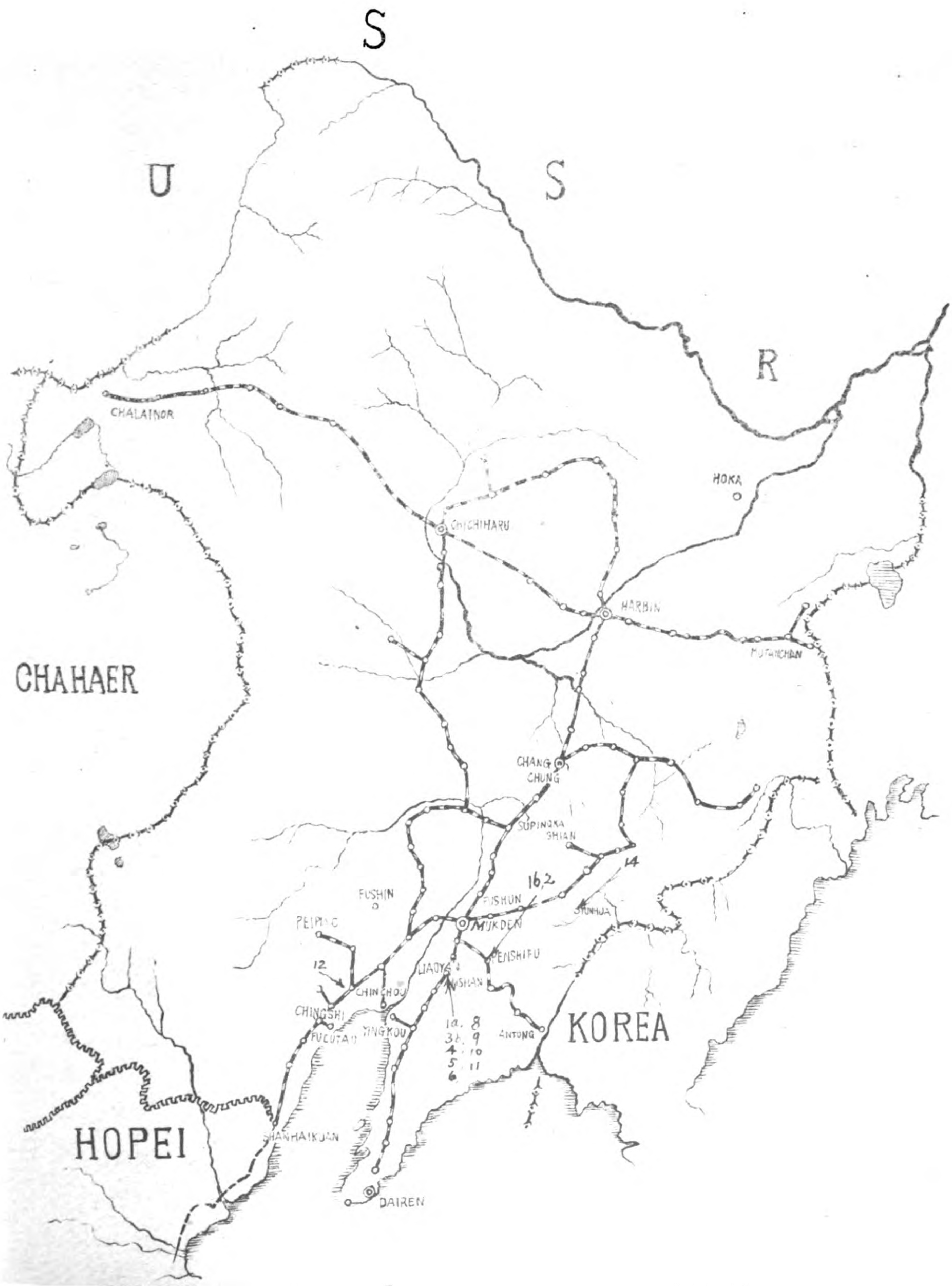
No. 2.

| Name of Firm | Locality | Main Products | Max. Capacity before Aug. 15, 1945 Tons | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 5. Otani Heavy Industry Co., Ltd.<br>大谷重工業株式會社 | Anshan | Steel plates, heavy machines | 67,500 | 235 Machines & parts. | 35 | [illegible]7,500 |  | 1,698,600 | 5[illegible] |  |
| 6. Japan Pipe Co.<br>滿洲日本鋼管株式會社 | Anshan | Welded pipes. | 5,700 | 206 Machines & parts | 25 | 360,000 |  | 272,000 | 30 |  |
| 7. Japan-Manshu Steel Fabrication Co. Ltd.<br>日滿鋼材工業株式會社 | Mukden | Window-frames, mining machinery | 1,924 | 403 Machines & parts | 40 | 294,574 |  | 995,817 | 66 |  |
| 8. Anshan Steel Fabrication Co., Ltd.<br>鞍山鋼材株式會社 | Anshan | Light rails, other sections. | 65,490 | 229 Machines & parts | 20 | 1,376,000 |  | 775,000 | 45 |  |
| 9. Kubota Iron Pipe Co., Ltd.<br>滿洲久保田鑄鐵管株式會社 | Anshan | Cast iron pipes | 462,000 | Tons 1,940 | 15 | 1,759,555 |  | 630,210 | 75 |  |
| 10. Manshu Wire Rope Co., Ltd.<br>滿洲鋼索株式會社 | Anshan | Wire rope | 7,422 |  | 25 | 56,525 |  | 244,939 | 51 |  |
| 11. Manshu Galvanizing Goods Co., Ltd.<br>滿洲亞鉛鍍株式會社 | Anshan | Wires, nails galvanized goods | 11,000 | 144 Machines & parts | 40 | 134,030 |  | 397,497 | 65 |  |

| [illegible] | [illegible] | Main products | [illegible] before April 1, [illegible] | Amount [illegible] | [illegible] | [illegible] | Value [illegible] | [illegible] | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 1. [illegible]<br>[illegible]式[illegible] | [illegible] | [illegible]<br>vanadium<br>electrolytic iron | | [illegible] parts | 9[illegible] | [illegible] | 1[illegible] | 1 | |
| 15. [illegible]<br>[illegible]式[illegible] | [illegible]ion | | | | | | [illegible] | 1[illegible],5[illegible] | |

16. In addition to the foregoing, there was also an iron works at [illegible], Tun-hwa, also [illegible] the [illegible] Iron [illegible]. [illegible] works operated [illegible] a [illegible] blast furnaces. [illegible] in [illegible] this works.

## 4. IRON AND STEEL INDUSTRY



U S S R
CHALAINOR
CHICHIHARU
HOKA
HARBIN
MUTANCHAN
CHAHAER
CHANG CHUNG
SUPINGKA
SHIAN
14
16,2
FUSHIN
FUSHUN
TUNHUA
PEIPIAO
MUKDEN
PENSHIFU
12
LIAOYA
ANSHAN
CHINCHOU
CHINGSHI
FUCUTAU
YINGKOU
1a. 8
3b. 9
4. 10
5. 11
6.
ANTONG
KOREA
HOPEI
SHANHAIKUAN
DAIREN

## 5. NON-FERROUS METAL INDUSTRY

| Name of Firm | Locality | Main Products | Annual Capacity before Aug.15,1945 Tons | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipment.% | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | No. of Machines and Parts | % of Original Equipment | Approx Value U.S.$ | Weight Tons | Approx Value U.S.$ |  |  |
| 1) Manshu Mining Co.,Ltd. Chin-si Mines | Yangchiatsangtse, Chinsi | Molybdite Concentrates | 500 | 848 | 35% | 1,007,949 |  | 334,665 | 90% |  |
| 滿洲礦山株式會社<br>楊家杖子鑛業所 |  |  |  |  |  |  |  |  |  |  |
| 2) Manshu Mining Mukden Co.,Ltd.<br>Mukden Smelting Works |  | Gold<br>Silver<br>Copper,lead | 600 Kg.<br>11 T.<br>7,000 T. | 141 | 10% | 74,450 |  | 611,210 | 17% |  |
| 滿洲鑛業開發株式會社<br>奉天製錬所 |  |  |  |  |  |  |  |  |  |  |
| 3) Tahsing Co.,Ltd Mukden Works | " | Rolled non-ferrous metal products | 4,151 | 97 | 15% | 27,500 |  | 280,046 | - |  |
| 滿洲大信興產株式會社 |  |  |  |  |  |  |  |  |  |  |
| 4) Manshu Ore Dressing Reagents Co.,Ltd. | " | Flotation reagents | 1,704 | 165 | 20% | 131,81[illegible] | 261 | 86,570 | - |  |
| 滿洲浮選劑株式會社 |  |  |  |  |  |  |  |  |  |  |
| 5) Manshu Light Metals Mfg. Co.,Ltd. |  |  |  |  |  |  |  |  |  |  |
| a) Fushun Works | Fushun | Aluminum ingots | 10,000 | 2,457 | 90% | 10,043,651 |  | 4,241,793 | 100% |  |
| 滿洲輕金屬製造株式會社 撫順工場 |  |  |  |  |  |  |  |  |  |  |
| b) Antung Works | Antung | Alumina | 30,000 |  | U N | K | N | O W | N | No information available. |
| 安東工場 |  |  |  |  |  |  |  |  |  |  |
| 6) Manshu Magnesium Co.,Ltd. | Yingkou | Magnesium ingots | 1,000 | 1,242 |  | 6,012,870 |  | 1,148,750 | 100% |  |
| 滿洲製 株式會社 |  |  |  |  |  |  |  |  |  |  |
| 7) [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |  | [illegible] |  | [illegible] | 100% |  |
| [illegible]株式會社 |  |  |  |  |  |  |  |  |  |  |

Information is lacking about the Non-ferrous metal mines now still in Communists' hands. The most important firms controlling these mines were following.

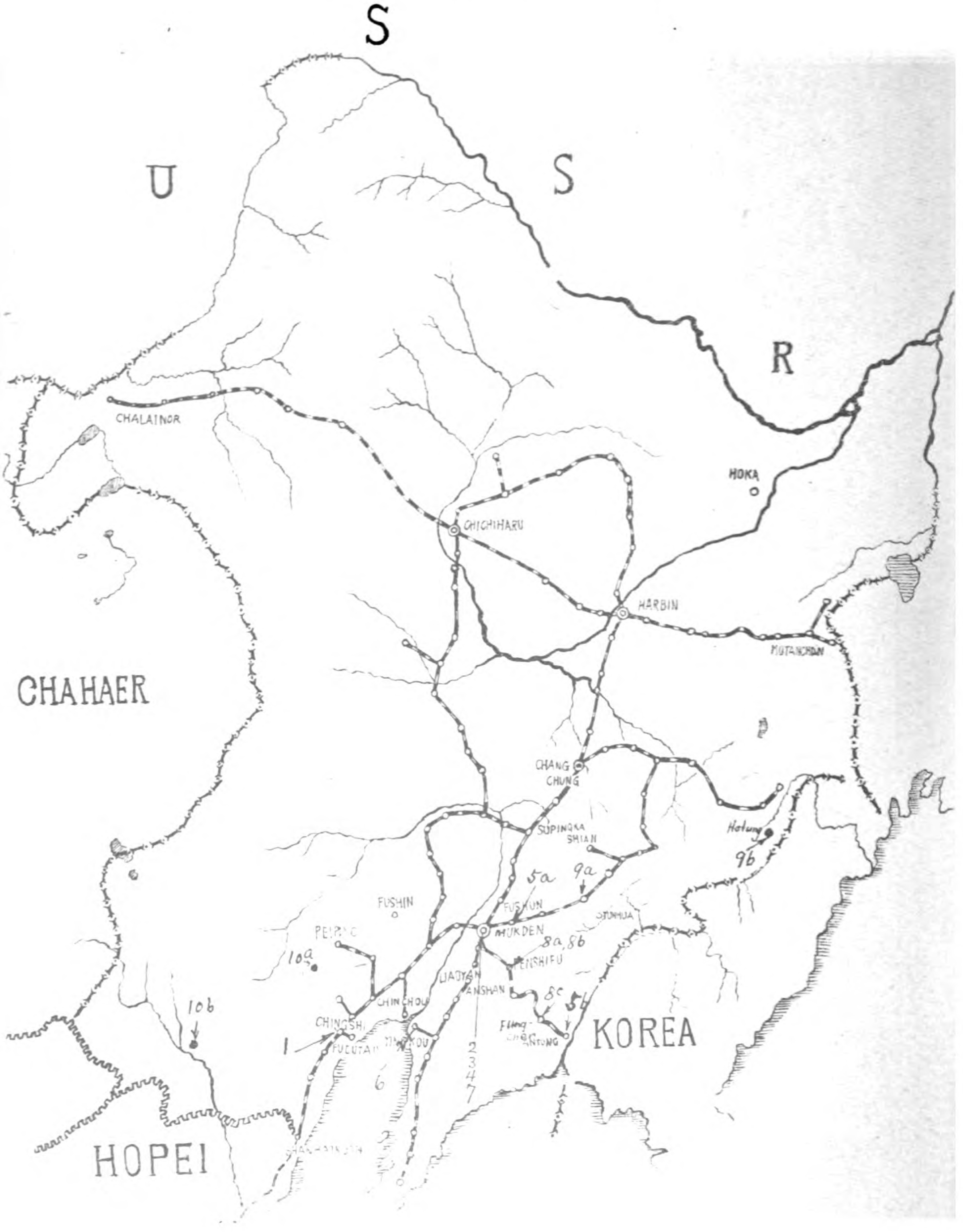
8. Manshu Copper & Lead Mining Co.,Ltd. Main office in Mukden. Mines at (a) Malukou (馬鹿溝). (b) Panlin (盤嶺) and (c) Linchiatai (林家臺). near Fungchen (鳳城)

9. Manshu Mining Co.,Ltd. Main office in Mukden and Mining and Ore dressing plants at (a) Chingyuan (清原). and (b) Holung (和龍). for copper and gold ores.

10. Teho Development Co.,Ltd. Main office in Mukden. Gold mines at (a) Chaoyang (朝陽) and (b) Chenteh (承德).

11. Manshu Gold Co. Main office in Changchang. This company operated and controlled gold production in Northern Manchuria where Auriferous sands are found in most tributaries of the River Heilung (黑龍江). Nuen (嫩江)。Sunghwa (松花江) Motan (牡丹) Tumcu (圖們江)etc.

# 5. NON-FERROUS METALS INDUSTRY


U S S R
CHALAINOR
HOKA
CHICHIHARU
HARBIN
MUTANCHIAN
CHAHAER
CHANG CHUNG
SUPINGKA
SHIAN
Holung
9b
5a
9a
FUSHIN
FUSHUN
STUHUA
PEIPIAO
MUKDEN
10a
8a, 8b
PENSHIFU
LIAOYAN
ANSHAN
CHINCHOU
8c
5b
10b
CHINGSHI
1
FUCUTAN
YINGKOU
Fung-cheng
ANTUNG
KOREA
6
2
3
4
7
SHANHAIKUAN
HOPEI

## 6. MACHINERY INDUSTRY

### (a) Mining Machinery

No. 1.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight | Approx. Value U.S.$ |  |  |
| 1. Mitsubishi Machine Works.<br>滿洲三菱機器株式會社 | Mukden | Mining machinery, machinery for chemical plant, spring, etc. | 10,800 T | 2,200 Sets | 90 | 1,000,000 |  | 2,800,000 | 95 |  |
| 2. Manshu Machine Works.<br>合資會社滿洲工作所 | Mukden | Transportation equipments for mining purposes | Coal wagons 2,000<br>Belt conveyors 1,500 units | 50 T | 30 | 50,000 |  | 30,000 | 50 |  |
| 3. Manshu San-ei Machine Works K.K.<br>株式會社三榮精機製作所 | Mukden | Parts of Mining machine | US$2,100,000 | Nil | Nil | Nil |  |  | Nil |  |
| 4. Ishikawajima Heavy Industry Co., Ltd.<br>石川島重工業株式會社 | Mukden | Cranes & boilers | 1,000 T |  | 95 | 513,000 |  | 300,000 | 98 |  |
| 5. Numata Machine Works, Ltd.<br>沼田機械工業株式會社 | Anshan | Small locomotives, boilers | 3,000 T | 50 Sets | 95 | 160,000 |  | 200,000 | 98 |  |
| 6. Yamato Machine Works, Ltd.<br>大和機器製造株式會社 | Mukden | Dump car, oil tanks. | 100 | 8 T | 25 | 10,000 | 25 | 15,000 | 40 |  |

## 6. [illegible] INDUSTRY

### (a) Mining Machinery

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 | Equipment Removed by Soviet Troops: Amount | % of Original Equipment | Value | [illegible] Soviet Troops: [illegible] | Value | Decrease in Production Capacity Due to Removal of Equipment % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 7. [illegible] Works, Ltd.<br>[illegible]洲[illegible]工株式會社 | Anshan | Shovels & scoops.<br>Picks. | [illegible]6,000 [illegible]<br>2,[illegible] " | 20 $ | 4[illegible] | 4[illegible],000 | [illegible] | 300,000 | 50 | |
| 8. Fushun Machine Works.<br>株式會社[illegible]製作所 | Fushun | Conveyor, crusher. | .. | .. | .. | .. | .. | .. | .. | Losses included in figure for Fushun Coal Mining Co. See list for "Coal Industry." |
| 9. Fushun Machine Works.<br>[illegible]製作所 | Fushun | Mining machines. | .. | .. | .. | .. | .. | .. | .. | Losses included in figure for Fushun Coal Mine. See list for "Coal Industry." |
| 10. Japan-Manchuria Steel Fabricating [illegible].<br>日満[illegible]材工業株式會社 | Mukden | Conveyor, crusher, ore cars, etc. | .. | .. | .. | .. | .. | .. | .. | See list for "Iron and Steel." |
| 11. Kubota Iron Pipe Co., Ltd.<br>久保田鐵管株式會社 | Anshan | Crusher, pipe. | .. | .. | .. | .. | .. | .. | .. | See list for "Iron and Steel." |
| 12. Otani Heavy Industry Co., Ltd.<br>大谷重工業株式會社 | Anshan | Crusher | .. | .. | .. | .. | .. | .. | .. | See list for "Iron and Steel." |

## 6. MACHINERY INDUSTRY

### (a) Mining Machinery

No. 3.

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 | Equipments Removed by Soviet Troops | | | Materials Removed by Soviet Troops | | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ | | |
| 13. Manshu Metallurgical Co., Ltd.<br>[illegible] | Anshan | Crusher, conveyor. | .. | .. | .. | .. | .. | .. | .. | See list for Iron and Steel . |
| 14. Manshu Metal Works, Ltd.<br>[illegible] | Mukden | Mining machinery. | 7[illegible] | | 10 | 50,000 | 300 | 300,000 | 10 . | |
| 15. Matsuo Machine Works, Ltd.<br>[illegible] 工所 | Mukden | Mining machinery. | 36 | | 20 | 64,000 | - | - | 20 | |
| 16. Kurimoto Machine Works, Ltd.<br>栗本製作所 | Fushun | Mining machinery. | 400 | U | N | K | N | O | W | N | Reports not yet received. |
| 17. Kirin Machine Works, Ltd.<br>[illegible] | Kirin | Mining machinery. | | U | N | K | N | O | W | N |
| 18. Mansan Machine Works, Ltd.<br>[illegible] 山 [illegible] 作所 | Changchun | Mining machinery. | | U | N | K | N | O | W | N |

## 6. MACHINERY INDUSTRY

### (a) Mining Machinery

No. 4.

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945. | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due ~ to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 19. Manshu Machine Works, Ltd.<br>滿洲機械製造株式會社 | Changchun | Mining & chemical industrial machineries. |  |  |  | U N K N O W N |  |  |  |  |
| 20. Manshu Mining Machine Works, Ltd.<br>滿洲鑛機株式會社 | Changchun | Mining & chemical industrial machineries. |  |  |  | U N K N O W N |  |  |  |  |

## 6. MACHINERY INDUSTRY

### (b) Tool Machinery

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 | Equipments Removed by Soviet Troops | | | Materials Removed by Soviet Troops | | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ | | |
| . . Manshu Tool Machine Works, Ltd.<br>滿洲工作機械株式會社 | Mukden | Auto-lathe,<br>Lathe,<br>Drilling machine,<br>Milling machine. | 60<br>300<br>120<br>120 | 2,500 [illegible] | 85 | 4,464,330 | 8,500 | 3,000,000 | 100 | |
| 2. Manshu Machine Works, Ltd.<br>滿洲[illegible]株式會社 | Mukden | Twist drill,<br>Taper drill,<br>Reamer,<br>Milling cutter,<br>Taps. | 300,000<br>30,000<br>10,000<br>10,000<br>5,000 | 25 [illegible] | 70 | 95,000 | 270 | 80,000 | 70 | |
| 3. Manshu Sato Kikai Seisaku Sho Co., Ltd.<br>滿洲佐藤機械製作所 | Mukden | Lathe shaper. | 180 | 20 | 10 | 150,000 | 15 | 4,000 | 10 | |
| 4. Toyo Seiki Co., Ltd.<br>東洋精機株式會社 | Mukden | Milling machines. | 100 | 8 | 10 | 75,000 | 20 | 4,800 | 75 | |
| 5. Tai-lou Machine Works.<br>大 陸 機 械 | Mukden | Lathes,<br>hobbing machines,<br>milling machines. | | | 5 | | 100 | 100,000 | 10 | |

[illegible]

## (d) Production of Miscellaneous Machinery

|  |  |  |  | Equipments Removed by Soviet Troops |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
| Name of Firm | Locality | Principal Products | Annual Capacity before Aug. 15, 1945 | Amount | % of Total Capacity | Value | [illegible] | Value | [illegible] | Remarks |
| 1. Hitachi Machine Works, Ltd.<br>株式會社日立製作所 | Mukden | Casting.<br>Small motors. | 3,000 ■<br>300 | 400 Sets with accessories. | 85 | 1,500,000 | 3,500 | 1,500,000 | . |  |
| 2. Kyowa Industrial Co., Ltd.<br>協和工業株式會社 | Mukden | Pump<br>Air compressor<br>Marine engine. | 500<br>50<br>10 | 20 ■ | 25 | 60,000 | - | 40,000 | 40 |  |
| 3. Manshu Takaoka Co., Ltd.<br>株式會社高岡組 | Mukden | Steel structure, fabrication. |  |  | 25 | 150,000 Including materials. |  |  | 50 |  |
| 4. Maeda Machine<br>前田鐵工所 | Mukden | Boilers<br>Radiators | 120<br>60,000 | 20 ■ | 5 | 50,000 | 250 | 40,000 | 5 |  |
| 5. Manshu Grinding Wheel Works.<br>滿洲砥石製造所 | Mukden | Grinding wheel<br>Oil stone<br>Sand cloth<br>Sand paper | 190 ■<br>10 ■<br>40,000 Dos.<br>200,000 ■ | 5 ■ | 10 | 6,850 | 150 | 33,800 | 10 |  |
| 6. Matsuda Machine Works.<br>松田機械製作所 | Mukden | Washington pump<br>Coal sender. | 20<br>150 |  |  | 10,000 Including materials |  |  | 10 |  |
| 7. Manshu Tetto Transmission Tower Co., Ltd.<br>滿洲鐵塔工業株式會社 | Anshan | Transmission | 5,000 ■ | 25 | 30 | 50,000 | 200 | 150,000 | 10 |  |

## 6. MACHINERY INDUSTRY

## (c) Processing & Miscellaneous Machinery

No. 2.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops: Amount | Equipments Removed by Soviet Troops: % of Original Equipment | Equipments Removed by Soviet Troops: Approx. Value U.S.$ | Materials Removed by Soviet Troops: Weight Tons | Materials Removed by Soviet Troops: Approx. Value U.S.$ | Decrease in Productive Capacity Due to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 8. Manshu Machine Works, Ltd.<br>滿洲機材工業株式會社 | Mukden | Fire engine<br>Hand pump<br>Pipe fittings | 40<br>300<br>1,000 Pcs. |  | 30 | 15,000 | 60 | 20,000 | 40 |  |
| 9. Manshu-Osaka Machine Works,, Ltd.<br>滿洲大阪精機工業所 | Mukden | Screws<br>Washers<br>Rivets | 1,500 T<br>34 "<br>200 " | 20 T | 25 | 25,000 | 200 | 30,000 | 40 |  |
| 10. Takai Machine Works, Ltd.<br>高井鐵工所 | Mukden | Overhead cranes. | 24 |  | 20 | 30,000 | 100 | 50,000 | 10 |  |
| 11. Morita Machine Works.<br>森田鐵工所 | Mukden | Steel structure, rolling mill. | 964 T | 10 T | 20 | 10,000 | 15 | 5,000 | 15 |  |
| 12. Lioyo Machine Works.<br>遼陽鐵工所 | Liaoyang | Machine work | - |  |  | 35,000<br>Including materials |  |  | 40 |  |
| 13. Kikumotor Machine Works.<br>菊本鑢製作所 | Mukden | Files | 1,900,000 In. | 2 T | 10 | 1,000 | 5 | 2,800 | 20 |  |

( [illegible] Y

(c) Products [illegible] Machinery

No. 3.

| [illegible] | [illegible]ity | [illegible] | Annual capacity before Aug. 15, 1945 | Equipment removed by Soviet Troops<br>% of total | Amount | Approx. value | [illegible] by [illegible] Approx. value | Decrease in Production capacity due to removal of [illegible] | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 14. [illegible] Ltd.<br>[illegible] | [illegible] | [illegible] moulds | 6,000 ¥ | 40 | [illegible]5,000 | | 20,000 | 50 | |
| 15. [illegible]<br>[illegible] | [illegible] of Dairen | Coal mining [illegible], hydraulic [illegible] machines, steel fabrication and other heavy machines. | Casting, [illegible] 93,600 ¥<br>Forging, [illegible] ¥<br>Others unknown | U N K N O W N | | | | | This factory was not completely equipped due to non-arrival of machines from America. |
| 16. [illegible] Bearing Co., Ltd.<br>[illegible] | Wafangtien | Ball and roller bearings. | | U N K N O W N | | | | | According to Japanese reports the equipments and materials were completely removed by Soviet troops. |
| 17. [illegible] Iron Works.<br>大信鐵作所 | Dairen | Rivet & nails | | U N K N O W N | | | | | |
| 18. [illegible] Iron Works.<br>中村鐵工所 | Dairen | Boiler | | U N K N O W N | | | | | |
| 19. [illegible] Machine Works.<br>[illegible] | Antung | Shovels, agricultural machines. | 5/0 | U N K N O W N | | | | | Reports not yet received. |

## 6. MACHINERY INDUSTRY

### (c) Processing & Miscellaneous Machinery

No. 4.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 20. Manshu Agricultural Machine Works, Ltd.<br>滿洲農機製造株式會社 | Harbin | Agricultural machine |  |  |  | U N | K N | O W | N |  |
| 21. Manshu Kranchi Iron Works.<br>滿洲宮崎鐵工所 | Changchun | Machineries in general |  |  |  | U N | K N | O W | N |  |
| 22. Nichiman Machine Works, Ltd.<br>日滿機工株式會社 | Mukden | Forgings | 600 | 75 | 70 | 100,000 | 2,080 | 1,200,000 | 70 |  |
| 23. Manshu Yokogawa Machine Works, Ltd.<br>滿洲橫河橋梁 | Mukden | Girder & cranes | 960 | 150 | 70 | 550,000 | 190 | 200,000 | 70 |  |
| 24. Asahi Machine Works, Ltd.<br>旭工業株式會社 | Mukden | Saddlery | US$870,000 | 10 | 50 | 5,000 | 40 | 1,000 | 50 |  |
| 25. Shinwa Shokai Co.<br>株式會社進和商會 | Mukden | Bolts & nuts | 5,400 | 110 | 30 | 500,000 | 120 | 120,000 | 30 |  |

## 6. [illegible]RY

### (c) [illegible] Miscellaneous Machinery

No. 5.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity due to removal of * | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original | Approx. Value | Weight | Approx. Value |  |  |
| 26. Star Metal Works, Ltd.<br>星金屬工業株式會社 | Tiling (near Mukden) | Power chains, bicycle spokes, |  |  | U | N K | N | O W | N | Reports not yet received. |
| 27. Asahi Screw Works, Ltd.<br>旭螺子株式會社 | Mukden | Parts of aeroplane | 550 | 5 | 10 | 1,200 | 20 | 2,500 | 15 |  |
| 28. Manshu Band Saw Mfg. Works, Ltd.<br>滿洲帯鋸工業 | Mukden | Band saw |  | 224 ■ | 80 | 842,000 | 80 | 128,000 | 80 |  |
| 29. Nippon Machine Works.<br>日本機械 | Mukden | Gear cutting |  | 85 ■ | 30 | 206,000 | 10 | 2,500 | 30 |  |
| 30. Manshu Ebara Machine Works.<br>荏原製作所 | Mukden | Pump | U.S.$180,000 |  |  |  | 350 | 100,000 | 27 |  |
| 31. Manshu Seikosho.<br>滿洲精鋼株式會社 | Harbin | Cast steel | 3,600 ■ |  | U | N K | N | O W | N |  |
| 32. Taika Machine Works.<br>大[illegible]工[illegible]所 | Mukden | Forging, casting. |  |  | U | N K | N | O W | N | Reports not yet received. |

## 6. MACHINERY INDUSTRY

## (c) Processing & Miscellaneous Machinery

No. 6.

| Name of Firm | Locality | Products | Amount of Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops | | | Materials Removed by Soviet Troops | | Decrease in Productive Capacity due to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipments | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ | | |
| 33. Fuji Machine Works, Ltd.<br>富士機械工業株式會社 | Mukden | Bicycle parts | 500 | 10 | 15 | 6,000 | 30 | 40,000 | 10 | |
| 34. Manshu Boiler Works, Ltd.<br>滿洲汽罐製造株式會社 | Changchun | Boilers | | | U | N K | N | O W | N | |
| 35. Hsinking Machine Works, Ltd.<br>新京重機工業 | Changchun | Hardwares | | | U | N K | N | O W | N | |
| 36. Manshu Internal Combustion Engine.<br>滿洲內燃機株式會社 | Mukden | Parts of internal combustion engine. | U.S.$500,000 | 340 | 95 | 400,000 | 240 | 180,000 | 95 | |
| 37. Toyo Automobile Mfg.Co.,Ltd.<br>東洋自動車株式會社 | Mukden | Automobile repairings | 300 | 200 ▼ | 100 | 5,000 | 600 | 890,000 | 100 | |
| 38. Sato Machine Works.<br>佐藤機械 | Mukden | Machineries in general. | | 20 | 30 | 40,000 | 15 | 4,000 | 40 | |
| 39. Sanko Denki, KK.<br>三光電氣株式會社 | Mukden | Electric parts of aeroplane. | 100 ▼ | 200 ▼ | 100 | 5,000 | 600 | 890,000 | 100 | |

## 6. MACHINERY INDUSTRY

### (a) Mining Machinery

No. 2.

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 7. Manshu Machine Works, Ltd.<br>滿洲機工株式會社 | Anshan | Shovels & scoops.<br>Picks. | 76,000 Dz.<br>2,000 " | 20 % | 40 | 40,000 | 800 | 300,000 | 50 |  |
| 8. Fushin Machine Works.<br>株式會社阜新製作所 | Fushin | Conveyor, crusher. | .. | .. | .. | .. | .. | .. | .. | Losses included in figure for Fushin Coal Mining Co. See list for "Coal Industry." |
| 9. Fushun Machine Works.<br>撫順製作所 | Fushun | Mining machines. | .. | .. | .. | .. | .. | .. | .. | Losses included in figure for Fushun Coal Mine. See list for "Coal Industry." |
| 10. Japan-Manchu Steel Fabrication Co.<br>日滿鋼材工業株式會社 | Mukden | Conveyor, crusher, ore cars, etc. | .. | .. | .. | .. | .. | .. | .. | See list for "Iron and Steel." |
| 11. Kubota Iron Pipe Co., Ltd.<br>久保田鋼鐵管株式會社 | Anshan | Crusher, pipe. | .. | .. | .. | .. | .. | .. | .. | See list for "Iron and Steel." |
| 12. Otani Heavy Industry Co., Ltd.<br>大谷重工業株式會社 | Anshan | Crusher | .. | .. | .. | .. | .. | .. | .. | See list for "Iron and Steel." |

## 6. MACHINERY INDUSTRY

### (a) Mining Machinery

No. 3.

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity due to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S. $ | Weight Tons | Approx. Value U.S. $ |  |  |
| 13. Manshu Metallurgical Co., Ltd.<br>[illegible]株式会社 | Anshan | Crusher, conveyor. | .. | .. | .. | .. | .. | .. | .. | See list for Iron and Steel. |
| 14. Manshu Metal Works, Ltd.<br>[illegible]株式会社 | Mukden | Mining machinery. | 700 |  | 10 | 50,000 | 300 | 300,000 | 10. |  |
| 15. Matsuo Machine Works, Ltd.<br>松[illegible]工所 | Mukden | Mining machinery. | 36 |  | 20 | 64,000 | - | - | 20 |  |
| 16. Kurimoto Machine Works, Ltd.<br>栗本製作所 | Fushun | Mining machinery. | 400 |  | U N K N O W N |  |  |  |  | Reports not yet received. |
| 17. Kirin Machine Works, Ltd.<br>吉[illegible]工[illegible]株式会社 | Kirin | Mining machinery. |  |  | U N K N O W N |  |  |  |  |  |
| 18. Mansan Machine Works, Ltd.<br>[illegible]山製作所 | Changchun | Mining machinery. | . |  | U N K N O W N |  |  |  |  |  |

# 6. MACHINERY INDUSTRY

## (a) Mining Machinery

No. 4.

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945. | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 19. Manshu Machine Works, Ltd.<br>滿洲機械製造株式會社 | Changchun | Mining & chemical industrial machineries. |  |  |  | U N | K | N O | W N |  |
| 20. Manshu Mining Machine Works, Ltd.<br>滿洲礦機株式會社 | Changchun | Mining & chemical industrial machineries. |  |  |  | U N | K | N O | W N |  |

## 6. MACHINERY INDUSTRY

### (b) Tool Machinery

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 1. Manshu Tool Machine Works, Ltd.<br>滿洲工作機械株式會社 | Mukden | Auto-lathe,<br>Lathe,<br>Drilling machine,<br>Milling machine. | 60<br>300<br>120<br>120 | 2,500 | 85 | 4,464,330 | 8,500 | 3,000,000 | 100 |  |
| 2. Manshu Machine Works, Ltd.<br>滿洲[illegible]機株式會社 | Mukden | Twist drill,<br>Taper drill,<br>Reamer,<br>Milling cutter,<br>Taps. | 300,000<br>30,000<br>10,000<br>10,000<br>5,000 | 25 | 70 | 95,000 | 270 | 80,000 | 70 |  |
| 3. Manshu Sato Kikai Seisaku Sho Co., Ltd.<br>滿洲佐藤機械製作所 | Mukden | Lathe shaper. | 180 | 20 | 10 | 150,000 | 15 | 4,000 | 10 |  |
| 4. Toyo Seiki Co., Ltd.<br>東洋精機株式會社 | Mukden | Milling machines. | 100 | 8 | 10 | 75,000 | 20 | 4,800 | 75 |  |
| 5. Tai-lou Machine Works.<br>大 陸 機 械 | Mukden | Lathes, hobbing machines, milling machines. |  |  | 5 |  | 100 | 100,000 | 10 |  |

## 6. MACHINERY INDUSTRY

### (c) Processing & Miscellaneous Machinery

No. 1.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Volume Tons | Approx. Value U.S.$ |  |  |
| 1. Hitachi Machine Works, Ltd.<br>株式會社日立製作所 | Mukden | Casting.<br>Small motors. | 3,600 ■<br>300 | 400 Sets with accessories. | 95 | 1,500,000 | 3,500 | 1,800,000 | 97 |  |
| 2. Kyowa Industrial Co., Ltd.<br>協和工業株式會社 | Mukden | Pump<br>Air compressor<br>Marine engine. | 500<br>50<br>10 | 20 ■ | 25 | 60,000 | - | 265,000 | 50 |  |
| 3. Manshu Takaoka Co., Ltd.<br>株式會社高岡組 | Mukden | Steel structure, fabrication. |  |  | 25 | 170,000 Including materials. |  |  | 50 |  |
| 4. Maeda Machine<br>前田鐵工所 | Mukden | Boilers<br>Radiators | 120<br>60,000 | 20 ■ | 5 | 30,000 | 250 | 40,000 | 5 |  |
| 5. Manshu Grinding Wheel Works.<br>滿洲[illegible]所 | Mukden | Grinding wheel<br>Oil stone<br>Sand cloth<br>Sand paper | 190 ■<br>10 "<br>40,000 Doz.<br>200,000 " | 5 ■ | 10 | 6,850 | 130 | 33,800 | 10 |  |
| 6. Matsuda Machine Works.<br>松田機械製作所 | Mukden | Washington pump<br>Coal sender. | 20<br>150 |  |  | 10,000 Including materials |  |  | 30 |  |
| 7. Manshu Tetto Transmission Tower Co., Ltd.<br>滿洲鐵塔工業株式會社 | Anshan | Transmission | 5,000 ■ | 25 | 30 | 50,000 | 200 | 150,000 | 10 |  |

## 6. MACHINERY INDUSTRY

## (c) Processing & Miscellaneous Machinery

No. 2.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops: Amount | % of Original Equipment | Approx. Value U.S.$ | Materials Removed by Soviet Troops: Weight Tons | Approx. Value U.S.$ | Decrease in Productive Capacity Due to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 8. Manshu Machine Works, Ltd.<br>滿洲[illegible]材工業株式會社 | Mukden | Fire engine<br>Hand pump<br>Pipe fittings | 40<br>300<br>1,000 Pcs. | | 30 | 15,000 | 60 | 20,000 | 40 | |
| 9. Manshu-Osaka Machine Works,, Ltd.<br>滿洲大阪精機工業所 | Mukden | Screws<br>Washers<br>Rivets | 1,300 ■<br>34 "<br>200 " | 20 ■ | 25 | 25,000 | 200 | 30,000 | 40 | |
| 10. Takai Machine Works, Ltd.<br>高井鐵工所 | Mukden | Overhead cranes. | 24 | | 20 | 30,000 | 100 | 50,000 | 10 | |
| 11. Morita Machine Works.<br>森田鐵工所 | Mukden | Steel structure, rolling mill. | 964 ■ | 10 ■ | 20 | 10,000 | 15 | 5,000 | 15 | |
| 12. Lioyo Machine Works.<br>遼陽鐵工所 | Liaoyang | Machine work | - | | | 35,000 Including materials | | | 40 | |
| 13. Kikumotor Machine Works.<br>菊本鑢製作所 | Mukden | Files | 1,900,000 In. | 2 ■ | 10 | 1,000 | 5 | 2,800 | 20 | |

## 6. MACHINERY INDUSTRY

## (c) Processing & Miscellaneous Machinery

No. 3.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops: Amount (% of Original Equipment) | Equipments Removed by Soviet Troops: Approx. Value U.S.$ | Materials Removed by Soviet Troops: Weight Tons | Materials Removed by Soviet Troops: Approx. Value U.S.$ | Decrease in Productive Capacity Due to Removal of Equipments % | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 14. [illegible] Machine Works, Ltd.<br>京原機械製作所 | Fushun | Ingot mould | 6,000 T | 40 | 25,000 | | 20,000 | 50 | |
| 15. Manshu Heavy Mach-<br>滿洲重機株式會社 | Outskirt of Dairen | Steel rolling mills, 6,000 T. hydraulic presses, steel fabrication and other heavy machines. | Casting, 93,720 T<br>Forging, 9,000 T<br>Others unknown | U N K N O W N | | | | | This factory was not completely equipped due to non-arrival of machines from America. |
| 16. Manshu Ball Bearing Co., Ltd.<br>滿洲軸受製造株式會社 | Wafantien | Ball and roller bearings. | | U N K N O W N | | | | | According to Japanese reports the equipments and materials were completely removed by Soviet troops. |
| 17. Daishin Machine Works.<br>大信製作所 | Dairen | Rivet & nails | | U N K N O W N | | | | | |
| 18. Nakamura Machine Works.<br>中村鐵工所 | Dairen | Boiler | | U N K N O W N | | | | | |
| 19. Manshu Machine Works.<br>滿洲鐵工所 | Anshan | Shovels, agricultural machines. | 570 | U N K N O W N | | | | | Reports not yet received. |

# 6. MACHINERY INDUSTRY

## (c) Processing & Miscellaneous Machinery

No. 4.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 20. Manshu Agricultural Machine Works, Ltd.<br>滿洲農機製造株式會社 | Harbin | Agricultural machine |  |  | U | N | K N | O W | N |  |
| 21. Manshu Kwanchi Iron Works.<br>滿洲宮崎鐵工所 | Changchun | Machineries in general |  |  | U | N | K N | O W | N |  |
| 22. Nichiman Machine Works, Ltd.<br>日滿鍛工株式會社 | Mukden | Forgings | 600 | 75 | 70 | 100,000 | 2,080 | 1,280,000 | 70 |  |
| 23. Manshu Yokogawa Machine Works, Ltd.<br>滿洲橫河橋梁 | Mukden | Girder & cranes | 960 | 150 | 70 | 550,000 | 190 | 200,000 | 70 |  |
| 24. Asahi Machine Works, Ltd.<br>旭工業株式會社 | Mukden | Saddlery | US$670,000 | 10 | 50 | 5,000 | 40 | 1,000 | 50 |  |
| 25. Shinwa Shokai Co.<br>株式會社信和商會 | Mukden | Bolts & nuts | 5,400 | 110 | 30 | 500,000 | 120 | 120,000 | 30 |  |

## [illegible]RY

### (a) [illegible] Machinery

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops: Amount | % of Original | Approx. Value | Materials Removed by [illegible]: Weight | Approx. Value | Decrease in Productive Capacity due to Removal of | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 26. [illegible] Metal Works, Ltd.<br>[illegible]工業株式會社 | Tiling (near Mukden) | Power chains, bicycle spokes, | | | U | N | K N | O W | N | Reports not yet received. |
| 27. Asahi Screw Works, Ltd.<br>旭螺子株式會社 | Mukden | Parts of aeroplane | 550 | 5 | 10 | 1,200 | 20 | 2,500 | 15 | |
| 28. Manshu Band Saw Mfg. Works, Ltd.<br>滿洲帶鋸工業 | Mukden | Band saw | | 224 [illegible] | 80 | 842,000 | 80 | 128,000 | 80 | |
| 29. Nippon Machine Works.<br>日本機械 | Mukden | Gear cutting | | 85 [illegible] | 30 | 206,000 | 10 | 2,500 | 30 | |
| 30. Manshu Ehara Machine Works.<br>荏原製作所 | Mukden | Pump | U.S.$130,000 | | | | 350 | 100,000 | 27 | |
| 31. Manshu Seikosho.<br>滿洲鋳鋼株式會社 | Harbin | Cast steel | 3,600 [illegible] | | U | N | K N | O W | N | |
| 32. Taika Machine Works.<br>大華工 所 | Mukden | Forging, casting. | | | U | N | K N | O W | N | Reports not yet received. |

## 6. MACHINERY INDUSTRY

## (c) Processing of Miscellaneous Machinery

No. 6.

| Name of Firm | Locality | Products | Original Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops | | | Materials Removed by [illegible] | | Increase in Productive Capacity due to Removal of [illegible] | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipment | Approx. Value [illegible] | Weight Tons | Approx. Value [illegible] | | |
| 33. Fuji Machine Works, Ltd.<br>富士機械工業株式會社 | Mukden | Bicycle parts | 500 | 10 | 15 | 6,000 | 30 | 40,000 | 10 | |
| 34. Manshu Boiler Works, Ltd.<br>滿洲汽缶製造株式會社 | Changchun | Boilers | | | U | N K | N | O W | N | |
| 35. Hsinking Machine Works, Ltd.<br>新京重機工業 | Changchun | Hardwares | | | U | N K | N | O W | N | |
| 36. Manshu Internal Combustion Engine.<br>滿洲内燃機株式會社 | Mukden | Parts of internal combustion engine. | U.S.$500,000 | 340 | 95 | 400,000 | 240 | 180,000 | 95 | |
| 37. Toyo Automobile Mfg.Co.,Ltd.<br>東洋自動車株式會社 | Mukden | Automobile repairings | 300 | 200 ■ | 100 | 5,000 | 600 | 890,000 | 100 | |
| 38. Sato Machine Works.<br>佐 藤 機 械 | Mukden | Machineries in general. | | 20 | 30 | 40,000 | 15 | 4,000 | 40 | |
| 39. Sanko Denki, KK.<br>三光電氣株式會社 | Mukden | Electric parts of aeroplane. | 100 ■ | 200 ■ | 100 | 5,000 | 600 | 890,000 | 100 | |

## 6. MACHINERY INDUSTRY

### (c) Processing & Miscellaneous Machinery

No. 7.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops | | | Materials Removed by Soviet Troops | | Decrease in Productive Capacity due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ | | |
| 40. Koe Machine Works.<br>興亞製作所 | Mukden | Parts of aeroplane. | 850 ■ | 200 ■ | 80 | 100,000 | 70 | 35,000 | 85 | |
| 41. Manshu Machine Works.<br>[illegible] | Mukden | Parts of aeroplane. | 60 ■ | 20 ■ | 90 | 150,000 | 50 | 500,000 | 60 | |
| 42. Koe Machine Works.<br>興亞金屬工業株式會社 | Mukden | Parts of aeroplane. | 500 ■ | 25 ■ | 40 | 15,000 | 20 | 42,000 | 50 | |
| 43. Manshu Ebara Machine Works.<br>滿洲荏原製作所 | Mukden | Centrifugal pump & blower. | 1,560 ■ | Nil | Nil | Nil | 318 | 150,000 | 30 | |
| 44. Seikyo Machine.<br>盛京精機株式會社 | Mukden | Watch | 10 ■ | 120 ■ | 100 | 75,000 | 85 | 55,000 | 100 | |
| 45. Manshu Kawasaki Machine Works, Ltd.<br>滿洲川崎鐵工株式會社 | [illegible] | [illegible]r, wire netting | 600 ■ | 1.5 ■ | 5 | 700 | 5 | 18,800 | 5 | |
| 46. Manshu Machine Works, K.K.<br>[illegible] | Mukden | Wire erecting tools. | 300 ■ | 20 ■ | 40 | 10,000 | 400 | 214,000 | 40 | |

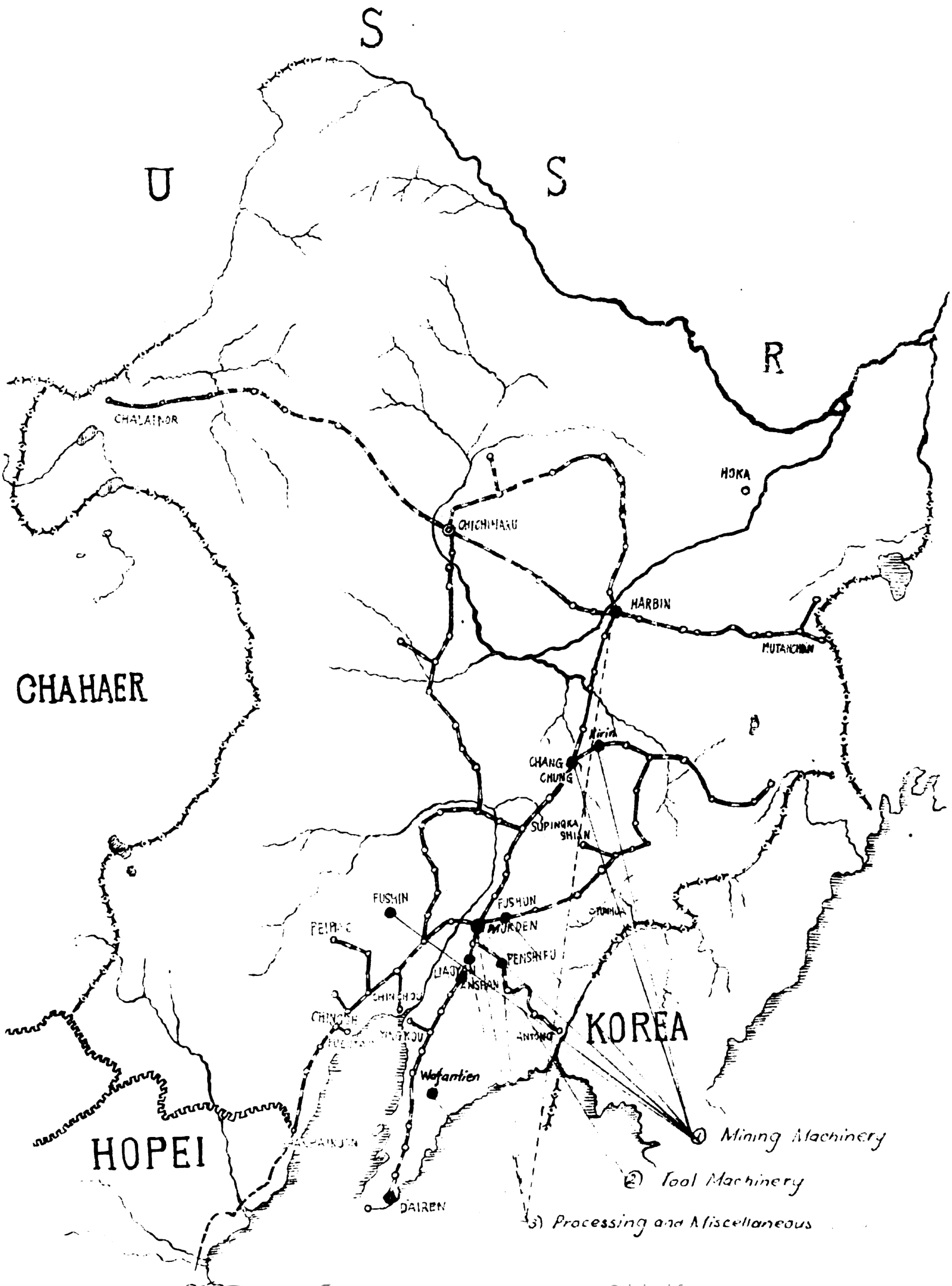
## 6. MACHINERY INDUSTRY

## (c) Processing & Miscellaneous Machinery

No. 8

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 Tons | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 47. Manshu Measuring Instruments Mfg. Co., Ltd.<br>満洲計器株式會社 | Mukden | Meters | 2,000 | 380 ■ | 100 | 180,000 | 1,400 | 204,000 | 100 |  |
| 48. Manshu Agricultural Machine Works, Ltd.<br>満洲農機工業株式會社 | Mukden | Agricultural tools | 1,500 | 20 ■ | 15 | 10,000 | 170 | 35,000 | 30 |  |
| 49. Manshu Mivata Machine Works.<br>株式會社満洲宮田製作所 | Mukden | Parts of aeroplane & bicycle. | 1,600 | 800 ■ | 100 | 400,000 | 132 | 565,000 | 100 |  |
| 50. Manshu Wire Netting Co., Ltd.<br>満洲金網製造株式會社 | Mukden | Wire, wire netting | 1,200 | 570 ■ | 100 | 143,000 | 20 | 25,000 | 100 |  |
| 51. Manshu Oxygen Plant Ltd.<br>満洲酸素工業株式會社 | Mukden | Oxygen gas |  | 2 | 20 | 5,000 | 1.5 | [illegible],000 | 20 |  |

# 6. MACHINEY INDUSTRY


U S S R
CHAHAER
HOPEI
KOREA
CHALAINOR
CHICHIHARU
HOKA
HARBIN
MUTANCHIAN
Kirin
CHANG CHUNG
SUPINQKA
SHIAN
FUSHIN
FUSHUN
MUKDEN
PEIPIAO
PENSHIHU
LIAOYAN
ANSHAN
CHINCHOU
CHINCSH
YINGKOU
ANTONG
Wafantien
DAIREN
① Mining Machinery
② Tool Machinery
3) Processing and Miscellaneous

## 7. TRANSPORTATION E UIPMENTS INDUSTRY

### (a) AutomobiXe Industry

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops: Weight Tons | Equipments Removed by Soviet Troops: % of Original Equipment | Equipments Removed by Soviet Troops: Approx Value U.S.$ | Materials Removed by Soviet Troops: Weight Tons | Materials Removed by Soviet Troops: Approx Value U.S.$ | Decrease in Productive Capacity Due to Removal of Equipment.% | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Manshu Automobile Mfg. Co.<br>滿洲自動車製造株式會社 | (a) Mukden | 1. Automobile assembly. Cabs & bodies manufactured & mounted. | 10,000 Cars | 1,650 T. | 100 | 4,000,000 | 16,660T | 41,000,000 | 100 | |
| | | 2. Repair U.S. parts. Production for several models of cars. | $13,500,000<br>4,500 T. | | | | | | | |
| | | 3. Gas producters | U.S.$7,500,000<br>3,500 T. | | | | | | | |
| | | 4. Automobile | 2,040 Cars | | | | | | | |
| 安東工場 | (b) Antung | 1. Automobile assembly. Cabs & bodies mounted. | 10,000 Cars<br>30,000 T | U N K N O W N | | | | | | According to Japanese reports the materials and equipments were completely removed by Soviet troops. |
| | | 2. Repair S.U. parts Production. Nissan Model. | $500,000 | | | | | | | |
| 2. Manshu Automobile Mfg. Co.,Ltd.<br>滿洲自動車製造株式會社 | 12 Branches in 12 principal cities. | Automobile repairs | 10,000 Cars | U N K N O W N | | | | | | According to Japanese reports, 3 Branches destroyed by fire. 1 Branch damaged. 8 Branches unknown. Materials on hand on Aug.15,1945, approximately U.S.$23,300,000. |

## 7. TRANSPORTATION EQUIPMENT INDUSTRY

### (a). Automobile Manufacture

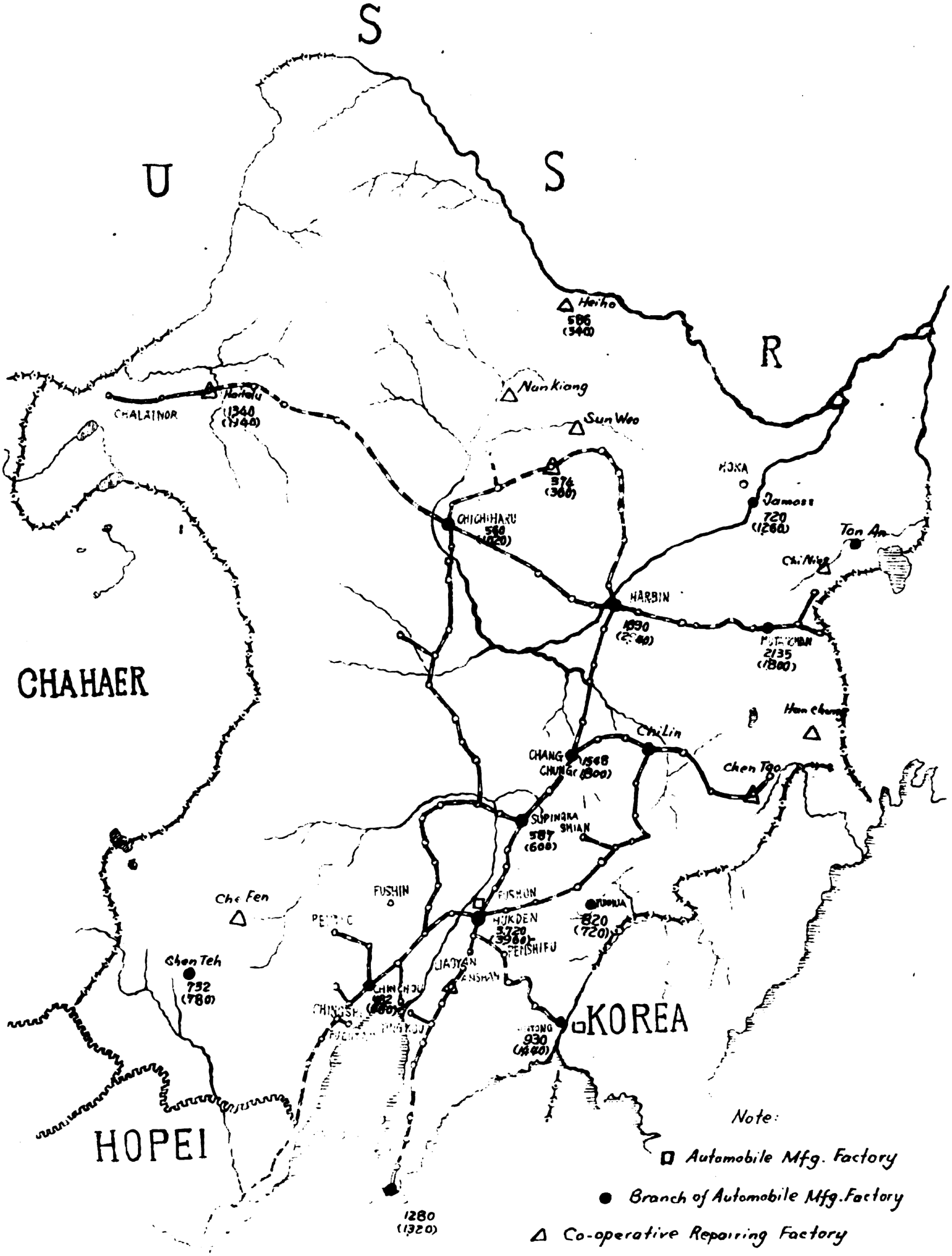

U S S R
Heiho
586
(540)
Nan Kiang
Sun Woo
CHALAINOR
Hailalu
1340
(1140)
576
(360)
HOKA
Jamoss
720
(1260)
Ton An
Chi Ning
CHICHIHARU
560
(1020)
HARBIN
1890
(2?80)
2135
(1800)
CHAHAER
Han Chung
Chi Lin
Chen Tao
CHANG CHUNG
1568
(800)
SUPINGKA
SHIAN
587
(600)
FUSHIN
FUSHUN
Che Fen
MUKDEN
3720
(3960)
TUNHUA
820
(720)
PENSHIFU
Chen Teh
732
(780)
CHINCHOU
182
(600)
LIAOYAN
ANSHAN
CHINGSH
ANTONG
930
(1440)
KOREA
HOPEI
1280
(1320)
Note:
Automobile Mfg. Factory
Branch of Automobile Mfg. Factory
Co-operative Repairing Factory

Figure 1 shows the Number of Cars registered in this District

Figure 2 (in Parenthesis) shows the Capacity of Repair.

7. TRANSPORTATION EQUIPMENT INDUSTRY

## (b) Locomotive & Railway Car Manufacture

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops | | | Materials Removed by Soviet Troops | | Decrease in Productive Capacity Due to Removal of Equipment.% | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipment | Approx Value U.S.$ | Weight Tons | Approx Value U.S.$ | | |
| 1. Manshu Locomotive & Railway Car Mfg. Co., Mukden Works.<br>滿洲車輛奉天工廠 | Mukden | Locomotive<br>Passenger car<br>Freight car | 60<br>60<br>1,200 | 74 Sets | 14 | 340,800 | | 517,375 | 40 | |
| 2. Manshu Machine Works<br>滿 洲 工 廠 | Mukden | Freight car<br>Mining machine<br>Boilers<br>Casting<br>Gasoline drum | 443<br>2,300 瓲<br>3,300 "<br>2,000 "<br>100,000 | 6,148 瓲 Including materials | 100 | 2,460,481 | | 2,640,688 | 100 | |
| 3. Dairen Machine Works. Mukden Works<br>大連機械奉天工場 | Mukden | 240 HP Small locomotive<br>Cast iron pipe<br>Steam boiler<br>Mining machine | 27<br>2,800 瓲<br>13<br>150 瓲 | | | 28,400 | | 56,600 | 10 | |
| 4. Dairen Machine Works<br>大連機械製作所 | Dairen | Locomotive<br>Passenger car<br>Freight car | 70<br>70<br>1,800 | U | N | K | N O | W | N | According to Japanese reports the equipments and materials of this factory were completely removed by Soviet troops. |
| 5. Dairen Railway Works<br>大連鐵道工場 | Dairen | Locomotive<br>Passenger car<br>Freight car | 70<br>40<br>300 | U | N | K | N O | W | N | According to Japanese reports, the Soviet troops is still utilizing this facility. |

## 7. TRANSPORTATION EQUIPMENTS INDUSTRY

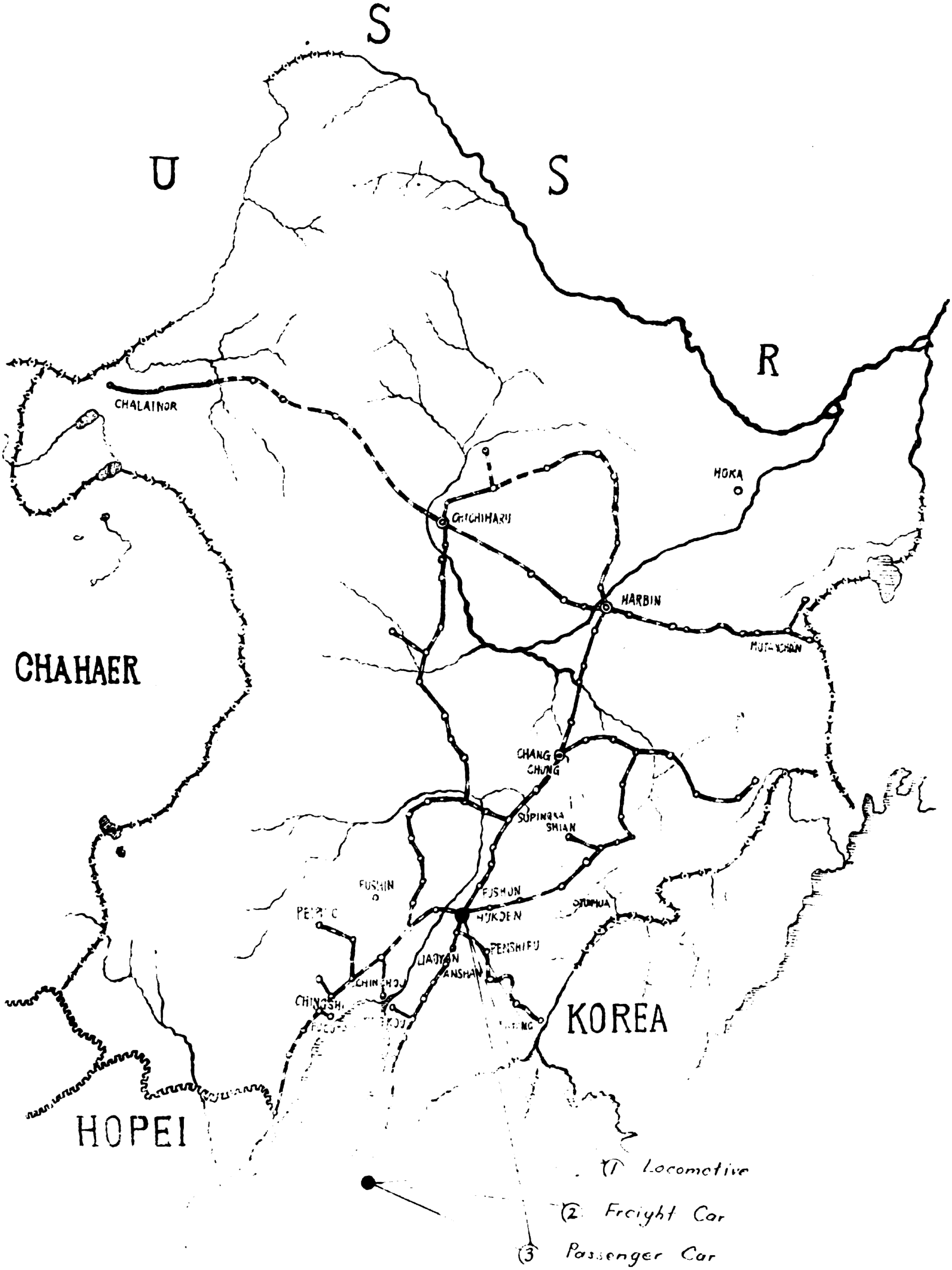
### (b) Locomotive & Railway Car Manufacture

No. 2

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipment.% | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx Value U.S.$ | Weight Tons | Approx Value U.S.$ |  |  |
| 6. Dairen Dock Works<br>大連船渠鐵工 | Dairen | Freight car | 800 | U | N K | N | O | W N |  | According to Japanese reports, the Soviet army is still utilizing this facility. |
| 7. Manshu Locomotive & Railway Car Mfg. Co. Dairen Works<br>滿洲車輛大連工場 | Dairen | Freight car | 800 | U | N K | N | O | W N |  | According to Japanese reports, the equipments and materials were completely removed by Soviet troops. |

# 7. TRANSPORTATION EQUIPMENT INDUSTRY

## 16) ● Locomotive and Railway Car Manufacture



U S S R
CHALAINOR
CHICHIHARU
HOKA
HARBIN
MUTANCHAN
CHAHAER
CHANG CHUNG
SUPINGKA
SHIAN
FUSHIN
FUSHUN
MUKDEN
TUNHUA
PENSHIFU
LIAOYAN
ANSHAN
CHINCHOU
CHINGSHI
KOU
KOREA
HOPEI
(1) Locomotive
(2) Freight Car
(3) Passenger Car

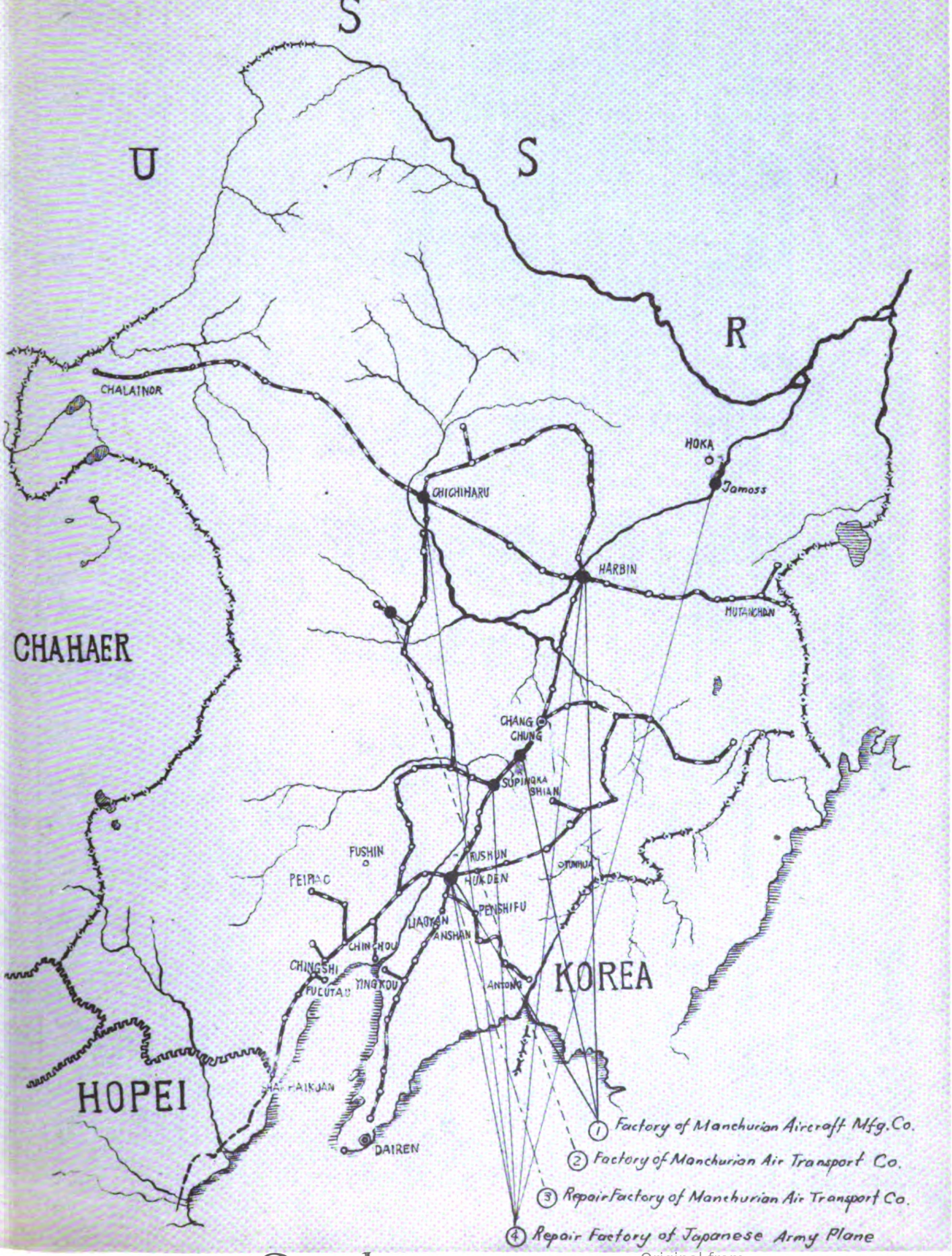
## 7. TRANSPORTATION EQUIPMENTS INDUSTRY

### (c) Aeroplane Manufacture

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipment % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx Value U.S.$ | Weight Tons | Approx Value U.S.$ |  |  |
| 1. Manchurian Aircraft Mfg. Co.<br>滿洲飛行機製造株式會社 | Mukden<br>Funturin Harbin<br>Harbin | Aeroplane & engine | Metallic training plane 1,200<br>Heavy fighter 600<br>450 HP engine 1,800<br>1,500 HP engine 750 | 9,636 | 95 | 26,268,000 | 5,527 | 25,861,000 | 100 |  |
| 2. Manchurian Air Transport Co. | Mukden | Aeroplane & engine repair | Plane repair 240<br>Engine repair 360 | 213 | 100 | 1,011,000 |  | 400,000 | 100 |  |
| 滿洲航空株式會社 | Pingtai | Aeroplane | Semi-wooden training plane 600 | 303 | 100 | 1,104,000 |  | 580,000 | 100 |  |
| 3. Japanese Army | Mukden | Aeroplane & engine | Plane repair 360<br>Engine " 720 | 1,305 | 100 | 6,739,000 | 8,632 | 21,925,000 | 100 |  |
|  | Other Districts | " |  | U | N | K | N | O | W | N |
| 4. Miyata Co. | Mukden | Aeroplane & engine repair | U.S.$2,340,000 | 627 | 85 | 519,000 | 99 | 444,000 | 100 |  |
| Manchurian Internal Combustion Engine Co. | Mukden | Engine parts | U.S.$ 468,000 | 540 | 90 | 438,000 | 8 | 34,000 | 100 |  |
| Other Subsidiary Cos. | Many Districts | Aeroplane & engine | Unknown | 3,543 | 33 | 4,119,000 | 731 | 2,985,000 | 100 |  |

# VII. TRANSPORTATION EQUIPMENT INDUSTRY

## (c). Aeroplane Manufacture



S
U
S
S
R
CHALAINOR
CHICHIHARU
HOKA
Jamoss
HARBIN
MUTANCHAN
CHAHAER
CHANG CHUNG
SUPINGKA
SHIAN
FUSHIN
FUSHUN
PEIPAO
MUKDEN
TUNHUA
PENSHIFU
LIAOYAN
ANSHAN
CHINCHOU
CHINGSHI
FUCUTAU
YINGKOU
ANTONG
KOREA
HOPEI
SHANHAIKUAN
DAIREN
① Factory of Manchurian Aircraft Mfg. Co.
② Factory of Manchurian Air Transport Co.
③ Repair Factory of Manchurian Air Transport Co.
④ Repair Factory of Japanese Army Plane

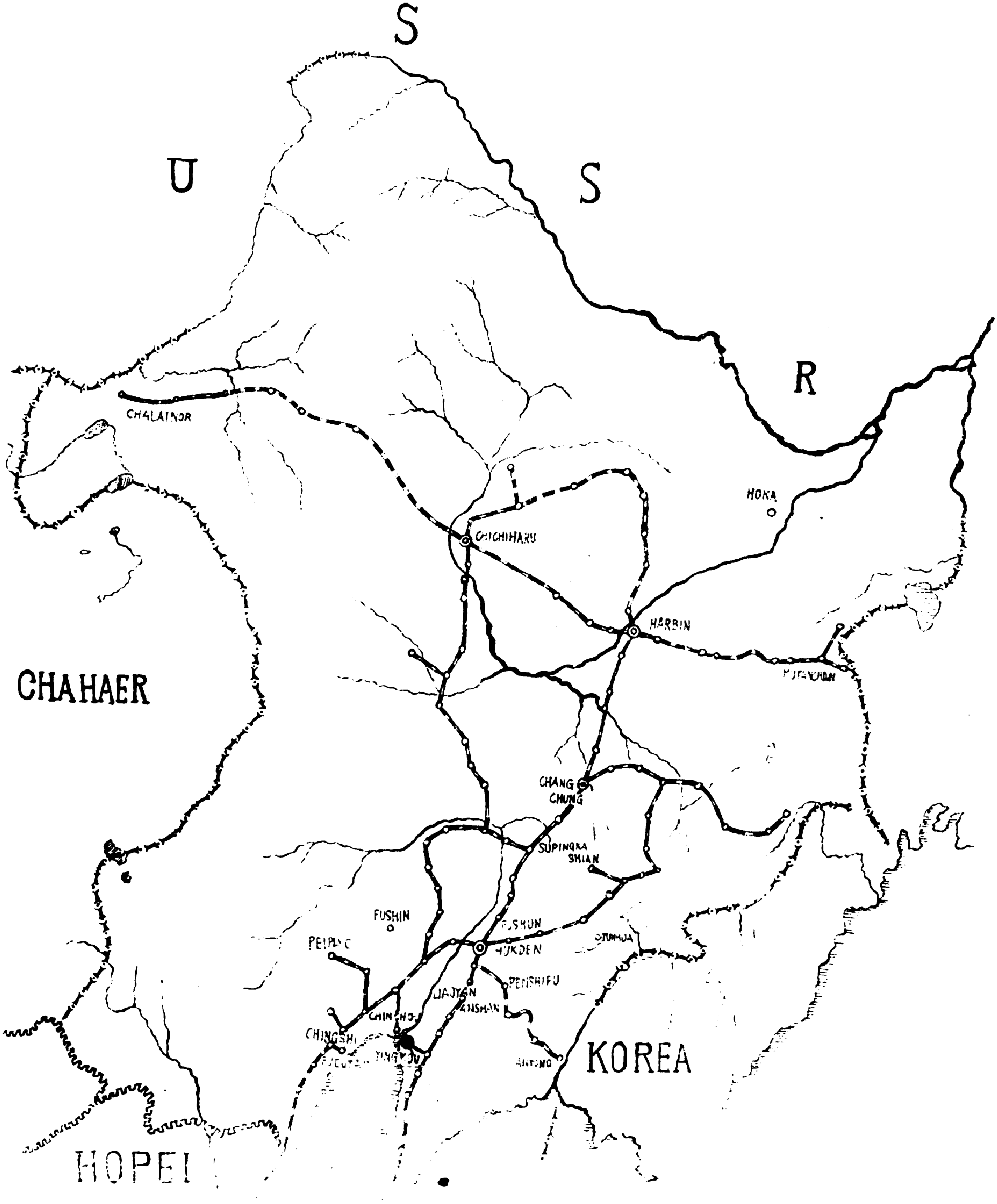
## 7. TRANSPORTATION EQUIPMENTS INDUSTRY

### (d) Ship-building

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 Tons | Equipments Removed by Soviet Troops |  |  | Materials Removed By Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipment. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Weight or Amount | % of Original Equipment | Approx Value U.S.$ | Weight Tons | Approx Value U.S.$ |  |  |
| 1. Dairen Ship-building & Machine Works<br>大連船 鐵工株式會社 | Dairen | Steamship | six 3,000 T. ships | U | N K | N | O W | N |  | According to information, Soviet are still utilizing facilities. |
| 2. Yingkow Ship-building Co.<br>營口造船株式會社 | Yingkow | Wooden boats |  | U | N K | N | O W | N |  | Reports have not yet received. |

7. TRANSPORTATION EQUIPMENT INDUSTRY

(d) Ship-building


U S S R
CHALAINOR
CHICHIHARU
HOKA
HARBIN
CHAHAER
MUTANCHAN
CHANG CHUNG
SUPINGKA
SHIAN
FUSHIN
FUSHUN
MUKDEN
TUNHUA
PEIPIAO
PENSHIFU
LIAOYAN
ANSHAN
CHINCHO
CHINGSHI
HULUTAO
YINGKOU
ANTUNG
KOREA
HOPEI

① Steam Ship

② Wooden Boat

## 8. ELECTRICAL MANUFACTURING INDUSTRY

No. 1.

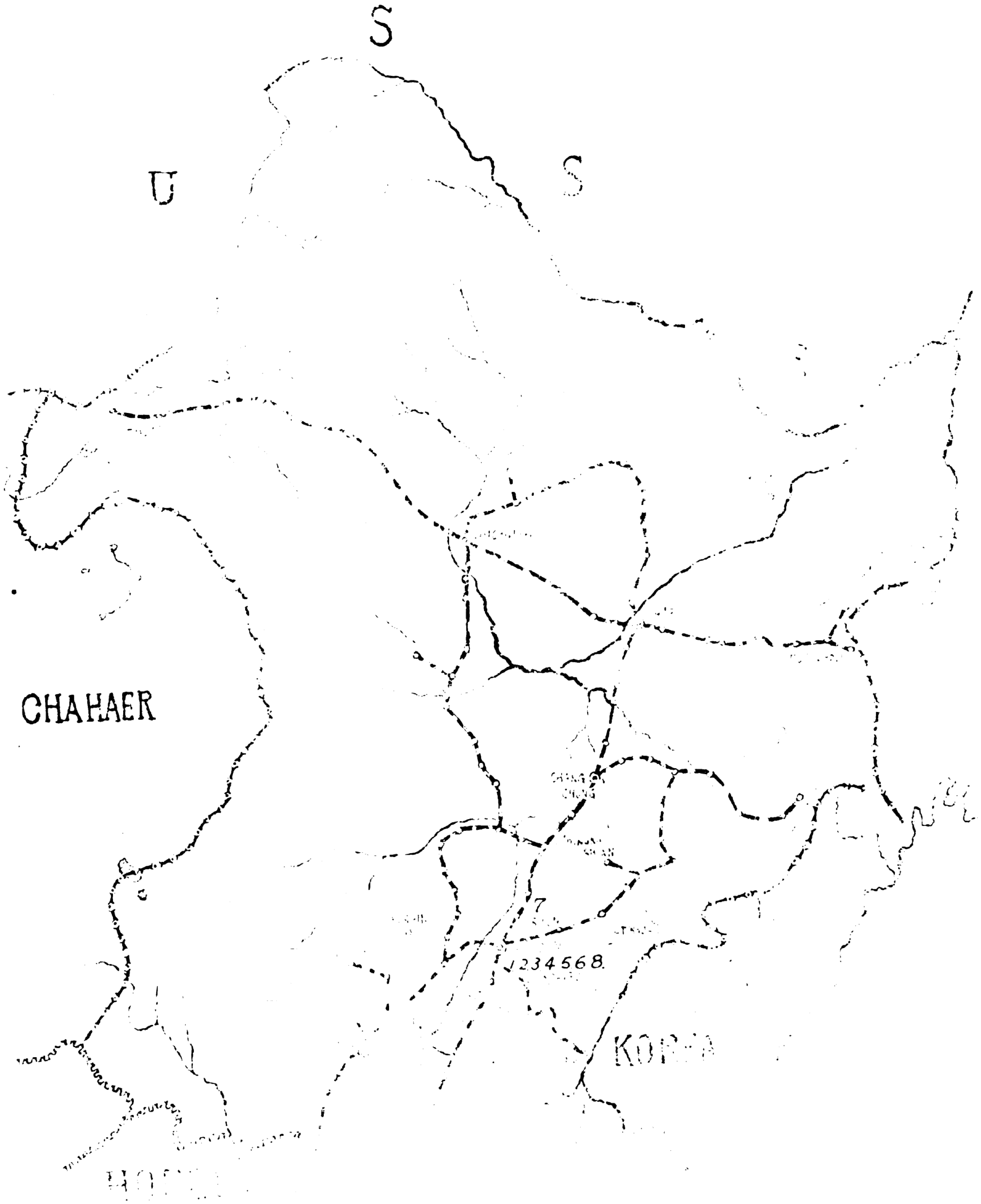
| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | [illegible] Re-moved by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Tons | Approx. Value U.S.$ |  |  |
| 1. Manshu Wire and Cable Co.<br>満洲電線株式會社 | Mukden | Wire & cable | 5,496 | 18,507 Sets | 95 | 300,000 | 13,421 | 12,942,000 | 100 |  |
| 2. Metal Electrical Lamp manufacturing Factory Ltd.<br>萬德電[illegible]株式會社 | Mukden<br>Fuchun | Electric lamps | 1,500,000<br>4,300,000 | 25 Sets<br>63 Pcs. | 5 | 5,620 | 110 | 475,000 | 50 |  |
| 3. Mukden Works.<br>奉天製作所 | Mukden | Motors,<br>Transformers,<br>Switchboard<br>and its accessories. | 20,000 HP<br>80,000 KVA<br>200 Sets<br>100 " | 580 Sets | 95 | 1,087,729 | 1,600 | 827,000 | 100 |  |
| 4. Manshu Transformers Factory Ltd.<br>満洲變壓器株式會社 | Mukden | Transformers | 120,000 KVA | 43 Sets<br>703 Pcs. | 10 | 17,488 | 220 | 106,000 | 100 |  |
| 5. Fuji Electrical Manufacturing Co., Ltd.<br>富士電機 | Mukden | Motors,<br>Switches | 30,000 HP<br>10,000 Sets | 580 | 80 | 3,187,000 | 2,100 | 3,112,000 | 100 |  |
| 6. Manchuria Dry Cell Co., Ltd.<br>満洲乾電池株式會社 | Mukden | Dry cell | 960,000 Cells | 60 | 30 | 1,870 | 125 | 19,700 | 40 |  |

## 8. ELECTRICAL MANUFACTURING INDUSTRY

No. 2.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 7. Manchuria Battery Co.<br>滿洲電池株式會社 | Fuchun | Battery | 154,000 Cells | 60 | 2 | 1,161 | - | 1,733 | 20 |  |
| 8. Manshu Electrical Communicating Machinery Co.<br>滿洲通信機株式會社 | Mukden | Telephone set,<br>Exchange S.W. board,<br>Vacuum tube,<br>Radio transmitter and receiver. | 2,000 Sets<br>150 "<br>1,060 "<br>40,000 Pcs. | 1,658 Sets<br>49,000 Pcs. | 100 | 849,370 | 1,800 | 3,427,000 | 100 |  |
| 9. Manshu-Tokyo Sibaura Electrical Machinery Co.<br>滿洲東京芝浦電氣株式會社 | Mukden | Lamps<br>Transmitting tube<br>Receiving tube<br>Watthour meter | 1,000,000 Pcs.<br>2,000 "<br>170,000 "<br>10,000 " | 80 Sets | 100 | 114,000 | 400 | 82,000 | 100 |  |
| 10. Manshu Yuasa Electric Battery Co.<br>滿洲湯淺電池株式會社 | Mukden | Electric battery | US$ 9,400 | 27 | 50 | 24,000 | 330 | 530,000 | 60 |  |

# 8. ELECTRICAL MANUFACTURING INDUSTRY


S
U
S
CHAHAER
7
1 2 3 4 5 6 8
KOREA
HOPEI

## CHEMICAL INDUSTRY

Acid and Alkalies : 1. 2. 3. 4. 5. 6. 37.

Fertilizer : 3. 4. 5.

Oil and Fats : 7. 8. 9. 10. 11. 12. 38. 39. 40. 41. 42.

Pulp and Paper : 13. 14. 15. 16. 17. 35. 36. 43. 44. 45. 46. 47. 57.

Ceramic and Refractories : 18. 19. 20. 21. 22. 23. 24. 25. 48. 49. 50. 51. 56.

Electrochemic Industry : 26. 52. 53.

Fermentation Industry : 27.

Rubber Industry : 28. 29. 30. 31. 54.

Tannery : 32. 55.

Explosive : 33. 34.

## 9. CHEMICAL INDUSTRY

No. 1.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15, 1945 Tons | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipment, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 1. S.M.R.Chemical Factory.<br>南滿洲鐵道株式會社<br>化 學 工 場 | Mukden | $NaoH$<br>$Hcl$ | 3,000<br>6,000 | Nil | Nil | Nil | 2,000 | 3,500 | Nil | This plant can start production as soon as it receives sufficient electric power supply. |
| 2. Manshu Soda Manufacturing Co.<br>Kaiyuan Factory<br>滿洲曹達開原廠 | Kaiyuan | $NaoH$<br>$Hcl$ | 3,000<br>2,000 |  | U | N K | N | O W | N | This plant used mercury cells. Mercury content of which about 10 tons have been taken away by the Soviet troops, and all the cells are damaged. It is almost impossible to operate this plant again. |
| 3. Manshu Chemical Industry Co., Ltd.<br>滿洲化學工業株式會社 | Dairen | $(NH_4)_2SO_4$<br>$NH_4NO_3$<br>Conc. $HNO_3$<br>Dil $H_2SO_4$ | 78,000<br>14,400<br>4,500<br>18,000 |  | U | N K | N | O W | N | According to the information received in Feb. 1946 3 sets of synthetic equipments out of four have been taken away. The present condition is not known. |
| 4. S.M.R. Shale Oil Plant.<br>南滿洲鐵道株式會社<br>撫順[illegible]工場 | Fushun | $(NH_4)_2SO_4$ | 16,108 | .. | .. | .. | .. | .. | 10 | Loss of equipment & materials included in figures for Fushun Coal Mine. See list for "Coal Industry". |
| 5. Manshu Iron Co./Ltd.<br>Anshan Works.<br>滿洲製鐵株式會社鞍山工場 | Anshan | $(NH_4)_2SO_4$ | 41,000 | .. | .. | .. | .. | .. | 77 | Loss of equipment & materials included in figures for Manshu Iron Co., Ltd. Anshan Works. See list for "Iron & Steel Industry". |

## 9. CHEMICAL INDUSTRY

No. 2.

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 Tons | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 6. Manshu Mining Co. Hulutao Works.<br>滿洲鑛山株式會社<br>葫蘆島製煉所 | Hulutao | Conc. $H_2SO_4$ | 10,000 | Nil | Nil | Nil | 456 | 176,506 | Nil |  |
| 7. Manshu Oil & Fat Co., Ltd.<br>滿洲油脂[illegible] | Mukden | Soap & fatty acid<br>Glycerine | 5,000<br>300 | Nil | Nil | Nil | 3,488 | 669,695 | Nil |  |
| 8. Manshu Kyodo Oil & Fat Co.<br>滿洲協同油脂株式會社 | Mukden | Soap | 650 | Nil | Nil | Nil | 380 | 10,450 | Nil |  |
| 9. Manshu Oil & Fat Co., Ltd.<br>滿洲油脂大連廠 | Dairen | Soap<br>Hardened oil | 500<br>12,000 | Nil | Nil | Nil | 1,440 | 414,000 | Nil | No information available since Feb. 1946. |
| 10. Manshu Cotton-seed Industry Co., Ltd.<br>滿洲棉實工業株式會社 | Liaoyang | Cotton-seed oil<br>Cotton-seed cake | 1,200<br>5,200 | Tons<br>15 | 10 | 1,000 | 400 | 200,000 | 20 |  |
| 11. Kansai Paints Co., Ltd.<br>關西油漆工業株式會社 | Mukden | Paint | 5,000 | Tons<br>50 | 20 | 50,000 | 480 | 250,000 | 50 |  |
| 12. Japan Paint Co., Ltd.<br>日本塗料株式會社 | Mukden | Paint<br>Zinc oxide | 15,000<br>1,000 | Nil | Nil | Nil | 300 | 150,000 | Nil |  |

## 9. CHEMICAL INDUSTRY

No. 3.

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 Tons | Equipments Removed by Soviet Troops | | | Materials Removed by Soviet Troops | | Decrease in Productive Capacity Due to Removal of Equipments. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ | | |
| 13. Manshu Paper Mill Co.,Ltd.<br>滿洲製紙株式會社 | Mukden | Paper, board | 2,400 | 18 Machines & parts | 10 | 575 | 50 | 33,500 | 15 | |
| 14. Chingchou Paper Mill Co., Ltd.<br>錦州紙[illegible]株式會社 | Chingchou | News paper. | 15,000 | Nil | Nil | Nil | 100 | 70,000 | Nil | |
| 15. Nippon-Manchu Pulp Mfg.Co.Ltd.<br>日滿紙[illegible]製造株式會社 | Tunghua | Pulp | 10,000 | All equip't. removed | 100 | Unknown | Unknown | | 100 | |
| 16. Yaluchiang Paper Mill Co., Ltd.<br>鴨綠江製紙株式會社 | Antung | Printing paper | 3,000 | All equip't. removed. | 100 | Unknown | Unknown | Unknown | 100 | |
| 17. Manshu Bean-stalk Paper Mill Co., Ltd.<br>滿洲豆桿紙漿株式會社 | Kaiyuan | Paper<br>Pulp | 2,500<br>2,000 | All equip't. removed. | 100 | Unknown | Unknown | Unknown | 100 | All equipments are Sweden made. |
| 18. Manshu Iwaki Cement Co.,Ltd.<br>滿洲磐城洋灰株式會社 | Liaoyang | Cement | 180,000 | 100 Machines & parts | 5 | 12,551 | 3,168 | 640,000 | 5 | |
| 19. Onoda Cement Co., Ltd.<br>小野田洋灰株式會社 | Anshan | Cement | 500,000 | 150 Machines & parts | 15 | 24,410 | 20 | 16,393 | 20 | |

## 9. CHEMICAL INDUSTRY

No. 4.

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 Tons | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments. % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 20. Manshu Iwaki Cement Co., Ltd.<br>滿洲本溪湖磐城洋灰株式會社 | Penhsihu Kun-yuan | Cement | 350,000 | Tons 4,430 | 70 | 2,476,345 | 2,650 | 407,291 | 100 |  |
| 21. Manshu Asano Cement Co.,Ltd.<br>滿洲淺野洋灰株式會社 | Fushun | Cement | 300,000 | 150 Machines & parts | 60 | 37,747 | 6,500 | 242,050 | 50 |  |
| 22. Manshu Asano Cement Co.,Ltd.<br>滿洲淺野洋灰株式會社<br>大同洋灰廠 | Chingsi | Cement | 300,000 | 24 Machines & parts | 5 | 5,297 | 5 | 3,148 | Nil |  |
| 23. High Grade Refractory Co.<br>高級爐材廠 | Anshan | Silica bricks<br>Fire " | 33,500<br>36,000 | 500 Machines & parts | 40 | 600,000 | 4,000 | 150,000 | 70 |  |
| 24. Manshu Shoko Glass Mfg.Co.<br>昌光硝子工業株式會社 | Mukden | Window panes | c/s 300,000 | 10 Machines & parts | 5 | 15,600 | 6,000 | 500,000 | 100 |  |
| 25. Manshu Optical Co.<br>滿洲光學工業株式會社 | Mukden | Service glass<br>Horn service glass<br>Repaired glass | Pcs. 9,500<br>400<br>2,000 | 532 Machines & parts | 100 | 707,500 | 120 | 300,089 | 100 |  |

# 9. CHEMICAL INDUSTRY

No. 5.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments.% | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 26. Manshu Electro Chemical Co., Ltd.<br>滿洲電氣化學工業株式會社 | Kirin | Calcium carbide | 17,000 |  | U | N K | N | O W | N | According to the information receive in Jan. 1946, most of the equipments were taken away by the Soviet troops. The present condition is unknown. |
| 27. Manshu Fermentation Works.<br>滿洲醱酵工業株式會社 | Mukden | Alcohol | Gal.<br>1,200,000 | Nil | Nil | Nil | 40 | 33,891 | Nil |  |
| 28. Toyo Tire Co., Ltd.<br>東洋タイヤ工業株式會社 | Mukden | Motor car tires & belts | 4,000 # | 1,641 # | 100 | 600,000 | 5,500 | 1,000,000 | 100 |  |
| 29. Bando Belting Co., Ltd.<br>滿洲阪東調帶株式會社 | Mukden | Belting | 1,500 # | 1,373 # | 100 | 83,900 | 500 | 78,957 | 100 |  |
| 30. Kokka Rubber Co., Ltd.<br>國華護謨化學工業株式會社 | Mukden | Rubber shoes<br>Belt | 1,500<br>360 | 350 # | 50 | 120,000 | 1,500 | 262,048 | 70 |  |
| 31. Manshu Rubber Co., Ltd.<br>滿洲護謨化學工業株式會社 | Liaoyang | Motorcar tires, belt. | 3,500 | 1,761 Machines & parts | 70 | 754,000 | 6,500 | 1,200,000 | 100 |  |

# 9. CHEMICAL INDUSTRY

No. 6.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops | | | Materials Removed by Soviet Troops | | Decrease in Productive Capacity Due to Removal of Equipments.% | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipment | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ | | |
| 32. Manshu Hikaku Co., Ltd.<br>滿洲皮革株式會社 | Mukden<br>" | Sole leather<br>Harness leather<br>Upper " | 900<br>400<br>120,000 m² | Nil | Nil | Nil | 300 | 200,000 | Nil | |
| 33. Manshu Explosive Co.,Ltd. Mukden Factory<br>滿洲火藥工業株式會社<br>奉天製造所 | Mukden | Am.Nitrate explosive<br>T.N.T. | 3,000 T.<br>200 T. | | NIL | | | | | |
| Fushun Factory<br>撫順製造所 | Fushun | Electric detonator<br>Ordinary detonator<br>Safety fuse | 40,000,000 Pcs.<br>20,000,000 "<br>30,000,000 m. | 70 Machines & parts | 40 | 36,432 | 240 | 55,340 | 70 | |
| Fushin Factory<br>阜新製造所 | Fushin | AM.Nitrate explosive | 2,100 T. | | .. | .. | .. | .. | 60 | Loss of equipments & materials in figures for Fushun Coal Mine. See list for "Coal Ind." |
| Liaoyang Factory<br>遼陽製造所 | Liaoyang | AM.Nitrate explosive<br>Black powder | 4,500 T.<br>600 T. | | .. | .. | .. | .. | 60 | Reports have not arrived yet. |
| Antung Factory<br>安東製造所 | Antung | Nitrate explosive<br>Black powder | 1,200 T.<br>300 T. | | UNKNOWN | | | | | |
| 34. S.M.R. Co., Ltd. Fushun Coal Mine Explosive Factory.<br>南滿洲鐵道株式會社<br>撫順煤礦火藥製造所 | Fushun | AM.Nitrate explosive | 1,7?0 T. | | | NIL | | | | |

## 9. CHEMICAL INDUSTRY

No. 7.

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipments % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipments | Approx. Value U.S.$ | Weight Tons | Approx. Value U.S.$ |  |  |
| 35. [illegible] Paper Co., Ltd.<br>[illegible]製紙株式會社 | [illegible] | Pulp<br>Paper. | 6,000 T.<br>3,000 T. | 31 Machines & parts | 5 | 26,250 | 400 | 100,[illegible]50 | 10 |  |
| 36. Manshu Chiko Co., Ltd.<br>滿洲紙工株式會社 | Mukden | Board paper & printing paper. | 6,000 |  | N | I | L |  |  |  |
| 37. Manshu Soda Manufacturing Co., Ltd. Dairen Factory<br>滿洲曹達株式會社大連工場 | Dairen | $Na_2CO_3$<br>NaOH | 36,000 T.<br>1,000 T. | U | N | K | N | O | W | N | This plant was still in good condition in Feb. 1946. No information available since then. |
| 38. Honen Oil Mill. Dairen Factory.<br>本年製油大連工場 | Dairen | Soya bean oil. | 15,000 T. | U | N | K | N | O | W | N | Benzene extraction. Equipments [illegible] made. |
| 39. Manshu Soya Bean Industry Co., Ltd.<br>滿洲大豆工業株式會社 | Dairen | Soya bean oil | 30,000 T. | U | N | K | N | O | W | N | Alcohol extraction. |
| 40. Santai Oil Mill.<br>株式會社三泰油房 | Dairen | Soya bean oil |  | U | N | K | N | O | W | N |  |

## 9. CHEMICAL INDUSTRY

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops: Amount | % of Original Equipments | Approx. Value U.S.$ | Materials Removed by Soviet Troops: Weight Tons | Approx. Value U.S.$ | Decrease in Productive Capacity Due to Removal of Equipments, % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 41. Mitsubishi Co., Ltd.<br>三菱商事株式會社 | Dairen | Soya bean oil |  | U N K N O W N |  |  |  |  |  |  |
| 42. Soya Bean Chemical Ind. Co. Ltd.<br>大豆化學工業株式會社 | Dairen | Soya bean oil |  | U N K N O W N |  |  |  |  |  |  |
| 43. Toyo Pulp Co. Co., Ltd.<br>東洋紙漿株式會社 | Wangching | Pulp<br>Printing paper. | 10,000 T.<br>3,000 T. | U N K N O W N |  |  |  |  |  |  |
| 44. Eastern Manshu Rayon Pulp Co., Ltd.<br>東滿人絹紙漿株式會社 | Kashantun | Pump | 10,000 T. | U N K N O W N |  |  |  |  |  |  |
| 45. Manshu Tokushu Paper Co., Ltd.<br>滿洲特殊製紙株式會社 | Kirin | Printing paper. | 5,000 T. | U N K N O W N |  |  |  |  |  |  |
| 46. Rokugo Paper Co., Ltd.<br>六合製紙株式會社 | Antung | Printing paper. | 3,500 T. | U N K N O W N |  |  |  |  |  |  |

## 9. CHEMICAL INDUSTRY

No. 9.

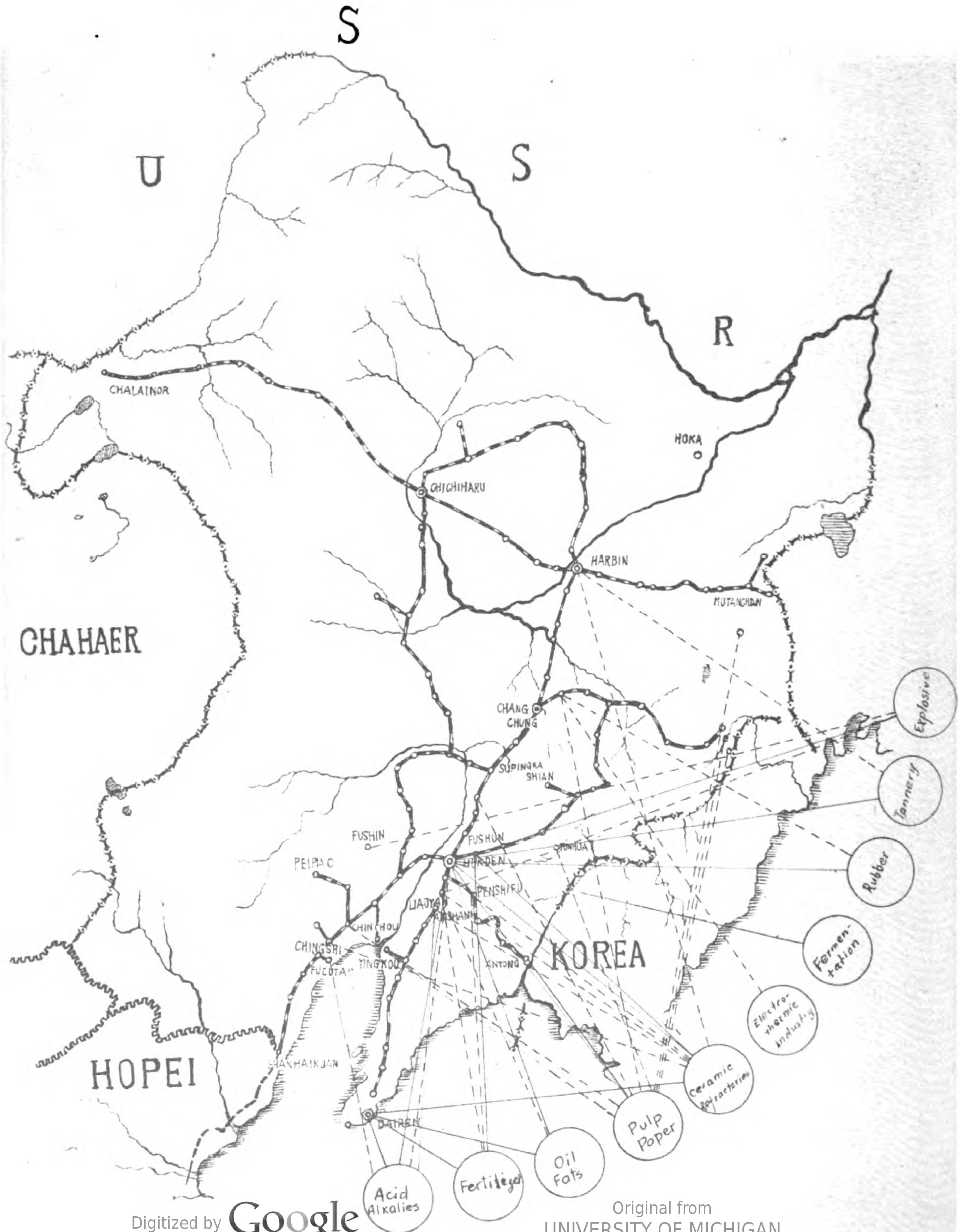
| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 | Equipments Removed by Soviet Troops: Amount | % of Original Equipment | Approx. Value U.S.$ | Materials Removed by Soviet Forces: Weight Tons | Approx. Value U.S.$ | Decrease in Productive Capacity Due to Removal of [illegible] | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 47. Manshu Pulp Co., Ltd.<br>滿洲紙[illegible]工業株式會社 | [illegible] | Pulp | 1[illegible],000 T. |  | U | N | K N | O | W N |  |
| 48. Manshu Asano Cement Co.<br>滿洲淺野洋灰株式會社 | [illegible] Hutawang | Cement | 300,000 T. |  | U | N | K N | O | W N |  |
| 49. Onoda Cement Co., Ltd.<br>滿洲小野田洋灰株式會社 | Chiento | Cement | 160,000 T. |  | U | N | K N | O | W N |  |
| 50. Harbin Cement Co., Ltd.<br>哈爾濱洋灰股份有限公司 | Harbin | Cement | 150,000 T. |  | U | N | K N | O | W N |  |
| 51. Kwantung-Shu Onoda Cement Co., Ltd.<br>關東州小野田洋灰株式會社 | Chowsuitze | Cement | 250,000 T. |  | U | N | K N | O | W N |  |
| 52. Manshu Carbon Industry Co.,Ltd.<br>滿洲炭素株式會社 | Antung | Carbon electrode & crucibles. | 5,000 T. |  | U | N | K N | O | W N |  |
| 53. Tokai Electrode Manufacturing Co., Ltd.<br>東海電極株式會社 | Antung | Carbon electrode | 5,000 T. |  | U | N | K N | O | W N |  |

## 2. CHEMICAL INDUSTRY

No. 10

| Name of Firm | Locality | Products | Annual Capacity before Aug. 15, 1945 | Equipments Removed by Soviet Troops: % of Original Equipment | Equipments Removed by Soviet Troops: Approx. Value U.S.$ | Materials Removed by Soviet Troops: Weight Tons | Materials Removed by Soviet Troops: Approx. Value U.S.$ | Decrease in Productive Capacity Due to Removal of Equipments % | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 54. Manshu Synthetic Rubber Co.,Ltd.<br>滿洲合成護謨株式會社 | Kirin | Synthetic rubber | | U N K N O W N | | | | | |
| 55. Sangosei Co., Ltd.<br>双合盛皮革株式會社 | Harbin | Sole leather,<br>harness<br>upper<br>fur. | 400 T.<br>" "<br>" " | U N K N O W N | | | | | |
| 56. Manshu Shoko Glass Mfg. Co. Dairen Factory.<br>滿洲昌光硝子工業株式會社 | Dairen | Window panes | 500,000 C/S | U N K N O W N | | | | | According to the information received in Feb. 1946, this plant was still in good condition. The present condition is unknown. |
| 57. Manshu Toyo Artificial Fiber.<br>滿洲東洋紡織株式會社 | Antung | Staple fiber | 1,000 T. | U N K N O W N | | | | | |

# 9. CHEMICAL INDUSTRY


S
U
S
R
CHALAINOR
HOKA
CHICHIHARU
HARBIN
MUTANCHAN
CHAHAER
CHANG CHUNG
SUPINGKA SHIAN
FUSHIN
FUSHUN
MUKDEN
TUNHUA
PEIPIAO
PENSHIFU
LIAOYA
ANSHAN
CHINCHOU
CHINGSHI
FUCUTAN
YINGKOU
ANTONG
KOREA
HOPEI
SHANHAIKUAN
DAIREN
Explosive
Tannery
Rubber
Fermen-tation
Electro-thermic industry
Ceramic Refractories
Pulp Paper
Oil Fats
Fertilizer
Acid Alkalies

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,[illegible] | Equipment Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipment. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Weight Tons | % of Original Equipment | Approx Value U.S.$ | Weight Tons | Approx Value U.S.$ |  |  |
| 1. Manshu Fu- kushima Cotton Co., Ltd.<br>満洲福島紡績株式會社 | Dairen | Cotton Yarn<br>" Fabrics | 3[illegible],[illegible]27 B/S<br>21,060 Pcs | - | - | - | 2,070 | [illegible] | S.<br>W. 0 | Spindles<br>43,5[illegible]0<br>Looms<br>110 |
| 2. Naigai Men Cotton Spin- ning Co., Ltd.<br>内外綿株式會社 | King Chou | Cotton Yarn<br>" Fabrics | 75,4[illegible] B/S<br>531,948 Pcs | - | - | - | 4,702 | 78,101,000 | S.<br>W. 0 | S. 108,352<br>L. 12,952 |
| 3. [illegible] Co- tton Spin- ning Co., Ltd.<br>滿和紡績株式會社 | [illegible] | Cotton Yarn<br>" Fabrics | 26,541 B/S<br>[illegible],988 Pcs | - | - | - | 1,537 | 17,937,000 | S.<br>W. 0 | S. 3[illegible],[illegible]8<br>L. ,332 |
| 4. Yinkou Cotton Spinning Co., Ltd.<br>營口紡織株式會社 | Yinkou | Cotton Yarn<br>" Fabrics | 38,810 B/S<br>355,620 Pcs | - | - | - | 3,234 | 50,105,000 | S.<br>W. 0 | S. 55,728<br>L. 1,730 |
| 5. Ton [illegible] Cotton Spin- ning Co., Ltd.<br>東棉紡織株式會社 | Chinchu | Cotton Yarn<br>" Fabrics | 34,529 B/S<br>170,352 Pcs | - | - | - | 2,708 | 64,689,000 | S.<br>W. 0 | S. 40,9[illegible]0<br>L. 2,912 |
| 6. Ton Mien Dyeing Co.<br>東棉染廠 | Chinchu | Piece dying | 9,000,000 m. | - | - | - | 150 | 1,180,000 | 0 | Jigger 30<br>Dryer 3 |

No. [illegible]

Products [illegible] Original Value [illegible] Remarks

[illegible] 110 [illegible] 110,000 [illegible] 1,000

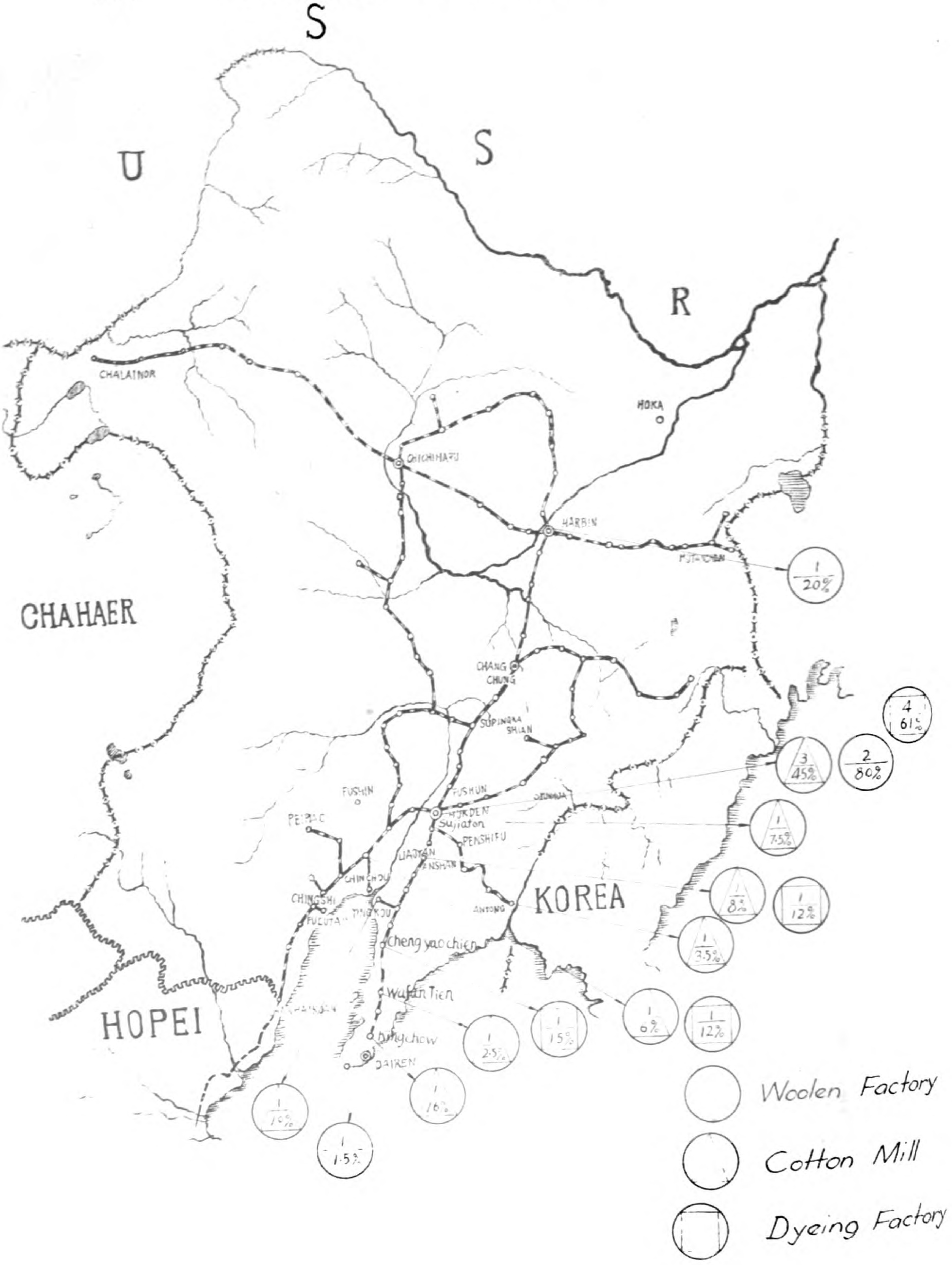
[illegible] 1,500,000 Kg. [illegible]

[illegible] Woollen fabrics 250,000 m [illegible] Blankets 500,000 m [illegible]

[illegible] Industry Co., Ltd. [illegible]

| Name of Firm | Locality | Products | Annual Capacity before Aug.15, 1945 | Equipment Removed by Soviet Troops: Weight Tons | Equipment Removed by Soviet Troops: % of Machine Equipment | Equipment Removed by Soviet Troops: Approx Value U.S.$ | Materials Removed by Soviet Troops: Weight Tons | Materials Removed by Soviet Troops: Approx Value U.S.$ | Decrease in Productive Capacity Due to Removal of Equipment | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 14. [illegible] Woollen Industry, Co., Ltd.<br>満洲[illegible]株式會社 | Mukden | Worsted cloth | 1[illegible] m | - | - | - | 60 | 16,[illegible],000 | 0 | Card 2<br>Ring 2<br>Looms 32 |
| 15. Tokuwa Dyeing Factory<br>[illegible]和紡績染色工廠 | Mukden | Piece dyeing | 15,000,000 m | 80 | 100 | 625,000 | 250 | 2,050,000 | 100 | Jigger 50<br>Dryer 5 |
| 16. [illegible] Dyeing Factory<br>営口染色株式會社 | [illegible] | Piece dyeing | 5,[illegible],000 m | - | - | - | 97 | 870,000 | 0 | J. 20<br>D. 3 |
| 17. [illegible] Dyeing Factory<br>[illegible]染色株式會社 | Mukden | Piece dyeing | 1,[illegible] m | - | - | - | 192 | 1,500,000 | 0 | J. 40<br>D. 4 |
| 18. [illegible] Dyeing Factory<br>[illegible]染色株式會社 | Mukden | Piece dyeing | 15,000,000 | - | - | - | 250 | 2,050,000 | | J. 50 |
| 19. South Manchurian Cotton Spinning Co., Ltd.<br>南滿洲紡績株式會社 | Liaoyang | Cotton Yarn<br>Cotton Fabrics | 24,5[illegible] B/S<br>234,000 Pcs | 2,058 | 100 | 29,375,000 | 1,585 | 45,618,000 | 100 | Spindles 35,280<br>Looms 1,300 |
| 20. Manchuria Toyo Cotton Spinning Co., Ltd.<br>滿洲東洋株式會社 | Antung | Cotton yarn<br>Cotton cloth | 11,143 B/S<br>117,93[illegible] Pcs | - | - | - | 1,001 | 19,95[illegible],000 | 0 | S. 10,000<br>L. 504 |
| 21. Kotoku Woollen Industry Co., Ltd.<br>康[illegible]毛織株式會社 | Harbin | Woollen Fabrics | 500,000 m | 4[illegible] | 100 | 3,375,000 | 480 | 35,000,000 | 100 | Card 4<br>Looms 20 |

# 10. TEXTILE INDUSTRY


U
S
S
R
CHALAINOR
HOKA
CHICHIHARU
HARBIN
CHAHAER
CHANG CHUNG
SUPINGKA SHIAN
FUSHIN
FUSHUN
MUKDEN
Sujiaton
PEIPIAO
PENSHIFU
LIAOYAN
ANSHAN
CHINCHOU
CHINGSHI
YINGKOU
ANTONG
KOREA
Cheng yao chien
Wafan Tien
Kingchow
DAIREN
HOPEI
1
20%
4
61%
3
45%
2
80%
1
7.5%
1
8%
1
12%
1
3.5%
1
2.5%
1
15%
1
6%
1
12%
1
10%
1
16%
1
1.5%
Woolen Factory
Cotton Mill
Dyeing Factory

## 11. ORDNANCE

### (a) Arsenal

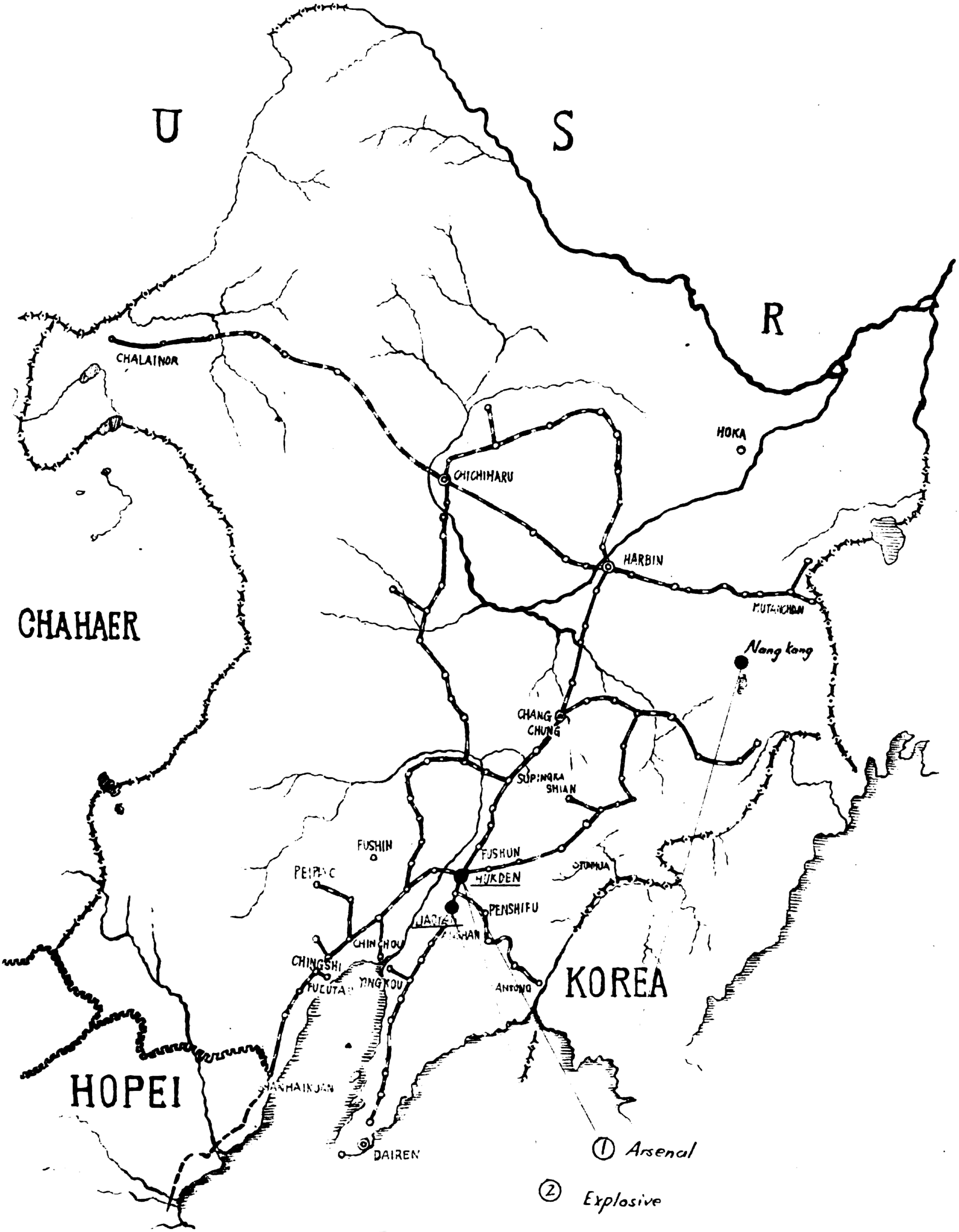
| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 Pieces | Equipments Removed by Soviet Troops | | | Materials Removed by Soviet Troops | | Decrease in Productive Capacity.Due to Removal of Equipment.% | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Amount | % of Original Equipment | Approx Value U.S.$ | Weight Tons | Approx Value U.S.$ | | |
| 1. Mukden Arsenal<br>奉天造兵所 | (a) Mukden Tatung District | Arms & ammunitions | Bayonet 120,000<br>Rifle 24,000<br>Machine Gun 1,680<br>Mountain Gun 600<br>Shell 720,000<br>Bullet 54,000,000 | 15,9000 | 20 | 1,987,500 | 14,350 | 3,867,500 | 80 | |
| | (b) Langkang Tangchengyung | | Rifle 12,000<br>Fuse 600,000<br>Bullet 36,000,000 | | U | N | K | N O | W N | Destroyed by fire. |
| 2. 918 Arsenal<br>九一八部隊 | Mukden Wenkuantun District | | 40<br>240,000 | 13,200 | 98 | 2,400,000 | 12,500 | 3,400,000 | 98 | |

## [illegible]

### ([illegible]) Explosives

| Name of Firm | Locality | Products | Annual Capacity before Aug.15,1945 | Equipments Removed by Soviet Troops |  |  | Materials Removed by Soviet Troops |  | Decrease in Productive Capacity Due to Removal of Equipment.% | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Amount | % of Original Equipment | Approx Value U.S.$ | Weight Tons | Approx Value U.S.$ |  |  |
| 1. Mukden Arsenal<br>奉天造兵所 | Mukden | Smokeless explosive | 1,500 | Nil | 100 | 2,500,000 | 1,000 T. | 250,000 | 100 | Explosives for mining & other purposes. See list for "Chemical Ind." |
| 2. 383 Arsenal<br>三八三部隊 | Liaoyang | T.N.T.<br>Picric acid | 3,000 T.<br>3,000 T. | Nil | 20 | 1,500,000 | 100% | 200,000 | 40 |  |

11. ORDNANCE


U S S R
CHALAINOR
CHICHIHARU
HOKA
HARBIN
MUTANCHAN
Nang kang
CHAHAER
CHANG CHUNG
SUPINGKA
SHIAN
FUSHIN
FUSHUN
PEIPIAC
MUKDEN
PENSHIFU
ANSHAN
TUNHUA
CHINCHOU
CHINGSHI
YINGKOU
FUCUTAI
ANTUNG
KOREA
SHANHAIKUAN
HOPEI
DAIREN
① Arsenal
② Explosive

## FUSHUN POWER PLANT

**Location:** The power plant is located on the grounds of the Fushun Coal Mine about 30 miles east of Mukden.

**Source and Reliability of Information:**

The coal mines and power plant were inspected by the Pauley Mission during June 1946. Mr. T. C. Chang was in charge of the power plant and information considered reliable was supplied by himself and Japanese technicians who had been working in the power station during the war and up to the present.

**Date Put in Operation:**

While coal mining operations have been conducted for hundreds of years at these mines, electric power was first developed in connection with mining operations in 1921.

**Description of Product and Plant Equipment:**

Not until the establishment of an interlocking power transmission grid in the 40's was the power plant able to supply power to consumers outside the mine. Under the Japanese the plant capacity was increased up to about 1941 (when the plant had a rated capacity of 285,000 kw.) to take care of the mechanization and electrification of mining operations. The equipment was reported to be:

### Turbo-generators

| No. | Kw. | Kv. | Cycles | Type | Maker |
|---|---|---|---|---|---|
| 1 | 12,500 | 11 | 60 | Single cylinder-single flow | General Electric |
| 1 | 12,500 | 11 | 60 | Double cylinder-single flow | SS & Mitsubishi |
| 2 | 25,000 | 11 | 60 | Single cylinder-single flow | Mitsubishi |
| 2 | 25,000 | 11 | 50 | Double cylinder-double flow | " |
| 3 | 50,000 | 11 | 50 | Double cylinder-triple flow | " |
| 1 | 10,000 | 11 | 50 | Single cylinder-single flow | " |

| | | | Boilers | | | |
|---|---|---|---|---|---|---|
| No. | Cap.T/Hr. | Steam Pres. Kg/sq.cm. | Steam Temp.°C | Type | Maker | Firing |
| 2 | 20 | 17.6 | 316 | WIF | B&W | Stoker |
| 3 | 66 | 27.5 | 400 | CTM | " | " |
| 2 | 60 | 27.5 | 425 | CTM | " | " |
| 2 | 120 | 27.5 | 425 | CTM | " | pulverized coal |

Removals and Dates:

Captain Santelli interviewed Mr. T. C. Chang, head of Fushun Electric Power Plant and Japanese technicians who were with the plant before and during removals. From these interviews the following was elicited: Twenty-one U.S.S.R. Army officers and two groups of 50 enlisted men were in charge of removals. Local labor and imported Japanese and Chinese labor were also used. The military personnel were suspected of being an armored unit as they had 4 tanks at the power plant. Thirty U.S. 6 x 6, 2-½ ton trucks were the only vehicular facilities brought in. The following list of Soviet officers, and their positions, were recalled from memory during the interview:

Maj. Gen. Sorokin - in Mukden - mentioned in discussions between Soviets at Fushun
Lt. Col. Rojestwensky - in general charge of removals
Lt. Col. Fiodoroff - financial matters
Lt. Col. Bishnovsky - staff officer in town of Fushun - evidently attended to other stripping in Fushun
Major Ivanoff - electrical engineer in charge of removing alternators
Major Worovtov - removed boilers
Captain Zavierko - removed turbines
Captain Kreetch -

Several hundred Soviet soldiers worked under the guidance of the 21 engineers. Most of the labor was Chinese and Japanese. A schedule for persons employed in removals was kept by the payroll accountant:

| | | | | | |
|---|---|---|---|---|---|
| September | 22 | 545 Men | October | 15 | 1667 Men |
| " | 27 | 1076 " | " | 20 | 2700 " |
| October | 1 | 1084 " | " | 25 | 2961 " |
| " | 5 | 1321 " | " | 30 | 2329 " |
| " | 10 | 1243 " | | | |

Supplementary record of removals is recorded below in translated extracts from a Japanese Diary.

9/20/45 - Russian Lt. Col. Rojestwensky (Tank Corps) came to the plant (Fushun Electric Power Plant) and had a conference with former manager, Mr. SHIROMA, Asakichi. He declared his desire to remove No. 6 and No. 9 turbo-alternators; also No. 20 and No. 22 boilers.

9/21/45 - Under the direction of the Russian Army officers, workmen, including employees from this plant and workers brought from outside (both Japanese and Chinese), started work of removal; also 2 Russian troops - 40-50 men each. (This removal work affected the boilers and alternators.)

9/22/45 - Russians seized stored material under their control, removing tools, etc.

9/27/45 - Lt. Col. Rojestwensky declared intention to remove the following equipment: turbo-alternators, Nos. 7, 8, 10 and 11; boilers, Nos. 16, 17, 18, 19 and 21; 20,000 kva 88/11 kv 1-transformer - 4 sets.

9/30/45 - The former manager, Mr. SHIROMA, Asakichi, began to make every effort to avoid the removal of Nos. 7, 8 and 11 turbo-alternators and Nos. 17 and 18 boilers, but all was in vain.

11/2/45 - The Russians suddenly stopped their removals, so that Nos. 16 and 17 boilers quite by accident were not taken.

11/5/45 - Lt. Col. Rojestwensky and his soldiers withdrew.

10/1/45 - A temporary comittee of 30 local Fushun citizens came to talk with the Russians to try to dissuade them from removing machinery.

The list of major equipment removals includes:

| No. | Description of Equipment |
|---|---|
| 2 | 25,000 kw, 50-cycle turbo-generators |
| 3 | 50,000 kw, 50-cycle turbo-generators |
| 1 | 10,000 kw, 50/60 cycle turbo-generator |
| 3 | Feed pumps - 500 kw, 350 T/hr. |
| 1 | Overhead crane from generator room |
| 5 | Boilers, 100 T/hr. CTM type, B&W make |
| 4 | Transformers - 20,000 kva. |
| 1 | Transformer - 12,000 kva. |
| 6 | Switchboards |

Auxiliary equipment of several other boilers

Miscellaneous auxiliary equipment and spare parts.

At the time of inspection, two old 25,000 kw generators were operating at half capacity producing 25,000 kw. One of these is in such bad condition (unbalance of rotor) that it cannot last many weeks of operation. The mine pumps operating on these generators were just able to keep even with the mine water. A breakdown in either generator, bringing about loss of pumping capacity, will result in flooding of the coal mine.

The two 12,000 kw. generators are in bad repair and have not been operated for several years. An effort is being made to put them in operating order.

The lack of electric power is the most important factor in preventing an increased coal output from the mines. Enough mining equipment remains to permit the daily output of coal to be increased from 2,500 tons per day to an estimated 8,000 tons per day with adequate power.

The necessity for producing coal for heating during the next winter of 1946-47 has presented the Chinese Nationalist Government with one of its most pressing economic problems. The removals of power equipment from the Fushun mines has precipitated problems in coal production and other dependent industries far in excess of the value of removals, besides introducing a serious threat to the future use of the mines from possible flooding.

PREPARED BY

C. B. Swift, Jr.

## ANSHAN PRIMARY SUB-STATION
(Formerly Manchuria Electric Power Company)

Location: Anshan (about 41°05'N - 122°55'E). Station is approximately 5 miles northwest of town.

Date Visited: 12 June 1946, by Taylor and Einig.

Source and Reliability of Information: Former Japanese technicians at the site; also, data from North East Chinese Economic Commission. These sources are considered fairly reliable and their information accepted as correct.

Date Established: 1940-41.

Purpose: Distribution of power to Anshan area from Fouhsin, Fushun, Yalu River, and Sungari River.

Capacity: 240,000 KVA (rated).

Equipment:

(a) Three 50,000 KVA each transformers inclosed in 22 foot thick concrete bomb shelters.

(b) Three 30,000 KVA transformers (in use).

(c) Two 30,000 KVA transformers (standby).

(d) Two Rotary Converters about 10,000 KVA each.

(e) Necessary circuit breakers, potential transformers, lightning arrestors, and power line towers.

(f) Control equipment and switchboards for transformers and converters.

(g) Communication equipment for power lines.

Removals: None.

Damage:

(a) Three Potential transformers - 140,000 V.

(b) Three Lightning Arrestors.

Both of the above on the incoming line from Fushun.

(c) About 60 small control switches from control room.

All of the above damage was done by Chinese Communists about 1 June 1946.

Present Condition: This plant can operate now but there is no current coming in.

Equipment Needed for Restoration of Plant: To restore this station to previous operating condition the following should be supplied:

(a) Three Potential transformers - 140,000 V.
(b) Three Lightning Arrestors
(c) Sixty Contact Switches

However, the station can operate now by bypassing this damaged equipment to other incoming lines.

Sources of Power for this Sub-Station:

| | Former | | | Future |
|---|---|---|---|---|
| Suiho | 200,000 KVA | - 50 cycle | to China | Removed by Soviets |
| Hydro | 200,000 " | 60 " | " Korea | 200,000 KVA-60 cyc.Korea |
| | 200,000 " | 50-60 " | Standby | 100,000 " 50-60 cycle Standby. Remaining 100,000 KVA available only to Kwantung Peninsula. |
| Tafengmen Hydro | 490,000 KVA | - 50 cycle | | 350,000 KVA removed by Soviets, leaving 140,000 KVA - 50 cycle. |
| Fouhsin | 160,000 KVA | | | Removed by Soviets. |
| Fushun | 260,000 KVA | | | 210,000 KVA removed by Soviets, leaving 50,000 KVA. |
| TOTAL | 1,510,000 KVA | | | 190,000 KVA |

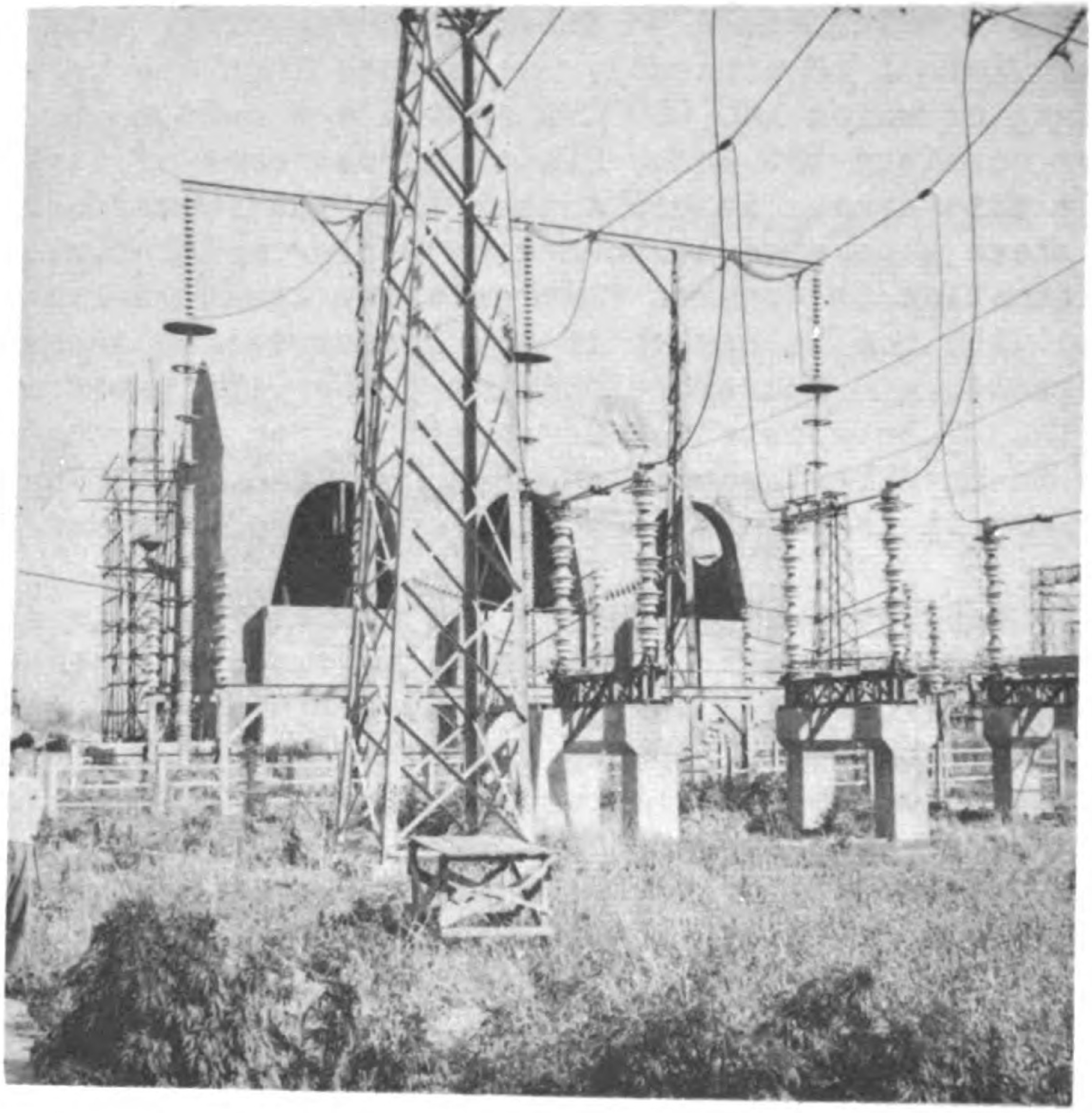
Distribution: Power from this station was distributed to the Anshan Steel Works and to all other industries in the Anshan Area. (See Distribution Chart in Source File 3-L-1).

Future Demands for Power: The immediate future demands for power in the Anshan area are very large and if any outside power is available, this substation can distribute it. However, of the 1,510,000 KVA which could be drawn upon formerly, only 190,000 KVA remain (about 13 percent). It may be that the Tafengmen Hydro Plant of which 140,000 KVA remain can send power into Anshan or possibly the Suiho Plant can use some of its standby power for this area. It would seem that the former sources of outside steam generated power are no longer available. Summing up the situation it appears that existing steam generated power in Anshan will not be enough if the industries of Anshan operate to any extent, and therefore outside power will have to be brought in. This substation is essential for this purpose and as it is in excellent condition, comparatively speaking, should remain where it is and be kept ready for immediate use.

Remarks: Perhaps it might occur to ask why the Soviets did not remove the whole or part of this sub-station. A Japanese Anshan Steel Works official had the following explanation: Anshan had two immediate sources of power, one being the Anshan Steel Works Power House, and the other through this sub-station. Part of the generators of the power house were removed and all the boilers shut down because of partial removals. It was necessary for the Soviets to have power at all times to work cranes, etc., for handling the heavy machinery they were pulling out of plants and putting on flatcars. For this purpose the sub-station had to remain intact to distribute power probably sent in from Suiho and Tafengmen Hydro Electric Stations.

PREPARED BY

Norman Taylor



Anshan Steel Works.

One of the largest substations in Asia. No removals were made here. 20-foot thick concrete protection walls can be seen around three 50,000 kva transformers.

## MANCHURIA POWER PLANTS--STEAM
## (Manchu Iron Works Power Station #1)

**Location:** Penchihu (41° 20' N 123° 45' E)

**Date Visited:** 10 June 1946, by Norman Taylor and John Hurndall.

**Source and Reliability of Information:** Actual inspection of the plant. Additional information was obtained from Japanese former official and director of the Manchu Iron Works (who was our guide during the inspection) and from the Chinese Northeast Economic Commission. Both of these sources are considered fairly reliable and their information accepted as true.

**Date Put in Operation:** 1915--1917

**Description of Product:** Electric power

**Capacity**--Rated 13,000 KW

**Outline of Plant Equipment:**

(a) 1 - 1500 KW Steam Turbo Generator
(b) 1 - 2500 KW " " "
(c) 1 - 3000 KW " " "
(d) 1 - 6000 KW " " "
(e) Necessary oil feed and auxiliary for above turbines and generators.
(f) Overhead power house crane rated about 75 tons.
(g) Fifteen sets of hand fired boilers 12 Kg/cm$^2$.
(h) Control equipment for generated power.

**Removals:** One 6000 KW turbo generator together with oil feed and auxiliary equipment. Also electric control and switchboard equipment for this much power. This generator was fairly new having been installed about 5 years.

**Destruction:** Little destruction was noted. This plant is old and the equipment is in bad shape with the exception of the one 6000 KW generator probably removed by the Soviets. There was some doubt as to who actually removed this generator - the Soviets or the Chinese Communist, but the equipment was missing and had been taken out about the time of the Soviet occupation. Of the remaining equipment totaling 7000 KW, one 1500 KW generator is operating, one 2500 KW generator can operate in about a week and the 3000 KW generator will need very extensive repairs (due to wear). Therefore about 4000 KW is about all that can be expected. It will not be advisable to install any new generating equipment because the boilers are very old and obsolete.

Equipment Needed for Restoration: Not advisable to install any new equipment or to restore.

Source of Coal: Coal was obtained from Penchihu Coal mine and can continue to be obtained there providing power is available to operate the mine.

Stockpiles: Very little coal is stockpiled.

Distribution of Power: Formerly, the power from this plant was used by the Penchihu Coal Mine and by the Penchihu part of the Manchu Iron Works.

Future Demand: Future demands for power in this area are large and far beyond the capacity of this plant. The 1500 KW generator now operating is all that the entire Penchihu-Kungyuan area has. The coal mine is running in a limited way on this power and can produce more coal when the 2500 KW generator is put into operation.

Remarks: This power plant should be maintained and continued in use until such time as new equipment can be brought in to serve the industries in this area which are quite large. The coal mine at Penchihu and blast furnaces at Kungyuan will be valuable assets if the latter is restored and this power plant cannot provide nearly enough power for them. When new generating equipment is installed or restored in power plants #2 and #3, this plant #1 can be maintained as a standby.

PREPARED BY

N. M. Taylor

## MANCHURIA POWER PLANTS--STEAM
(Manchu Iron Works Power Station #2)

**Location:** Penchihu (41° 21' N 123° 45' E)

**Date Visited:** 10 June 1946, by Norman Taylor and John P. Hurndall.

**Source and Reliability of Information:** Additional information was obtained from Japanese former official and director of the Manchu Iron Works (who was our guide during the inspection) and from the Chinese Northeast Economic Commission. Both of these sources are considered reliable and their information accepted as true

**Date Put in Operation:** 1939

**Product:** Electric Power 50 Cycle AC

**Capacity:** 28,000 KW

**Equipment:**

(a) Two sets 14,000 KW steam turbo generators.
(b) Necessary oil feed and auxiliary equipment for turbines and generators.
(c) One 100 ton power house crane.
(d) Transformers, circuit breakers, and electric control equipment for generators and transformers.
(e) Three sets of unit system pulverized coal fired boilers - 80 tons/hour 27 Kg/cm$^2$ at 385° C.
(f) Coal handling equipment for above boilers.

**Destruction:** The Chinese Communists set off a charge of explosives in one of the boilers of this plant and almost completely wrecked the entire plant. The building itself is destroyed but it may be possible to salvage the two turbo-generators and one boiler. The transformers and control equipment are badly damaged. The coal handling equipment is probably beyond repair. More will be known as to the exact condition of individual pieces of machinery, etc., when some of the wreckage is cleared away and a more complete examination can be made.

It may be possible to restore about one third of this plant's electric power production within six months' time providing the preliminary examination is correct as to the boilers. If both generators are not damaged, it would be practical to rebuild the whole plant but this would take over one year's time.

Equipment Needed for Restoration: The equipment needed for 100 percent restoration would be two boilers, all transformers and control equipment, coal handling equipment, and all other auxiliary equipment damaged by the blast. No correct list of this is available at this time.

Source of Coal: Coal for firing the boilers was obtained from the Penchihu Coal mine and can be secured there in the future providing electric power is available for operating the mine.

Stockpiles: No stockpile of coal.

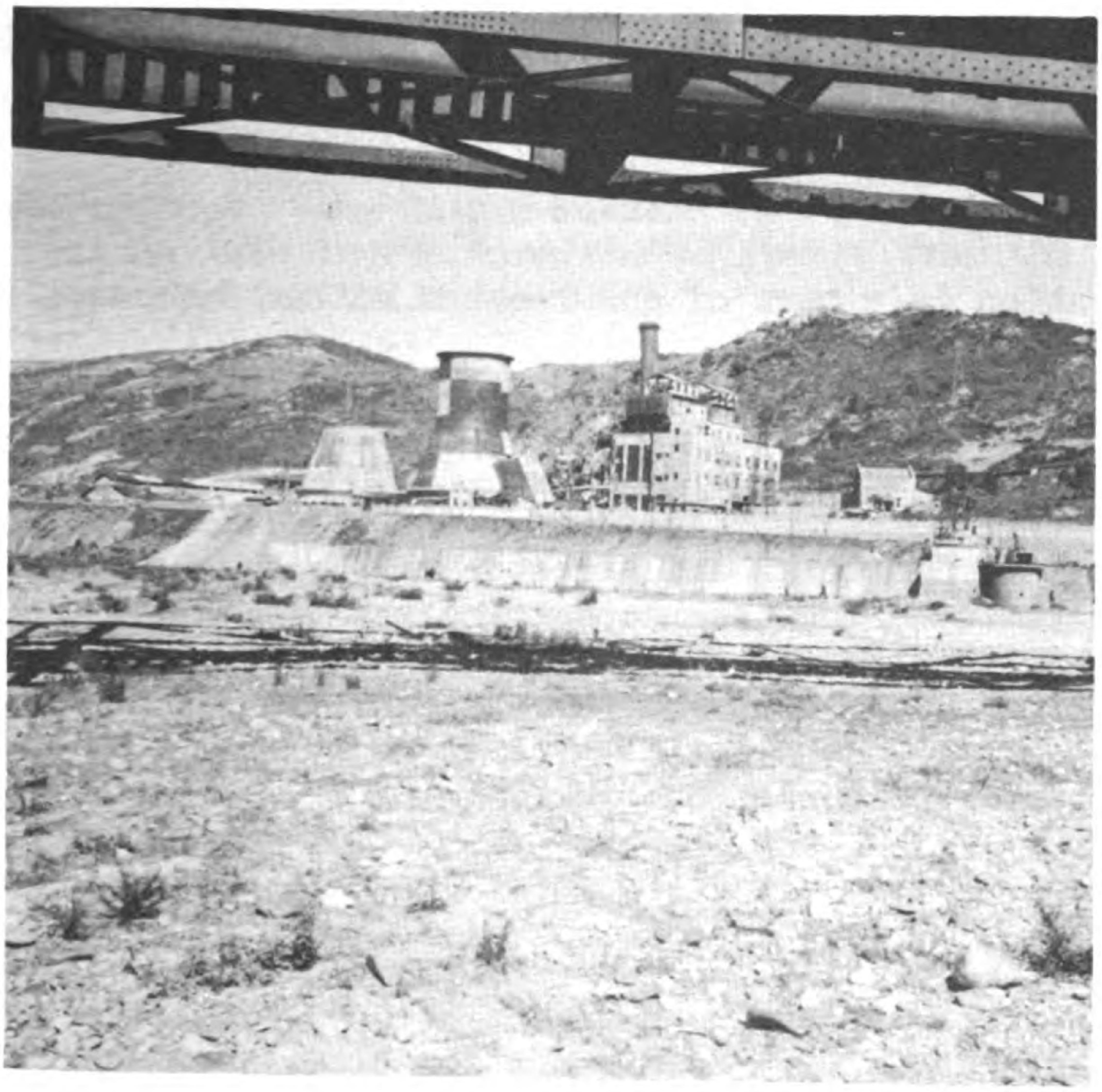
Distribution of Power: This electric power was used for the industries in the Penchihu-Kungyuan area and for domestic use in the same vicinity.

Immediate Future Demand for Power: If the iron and coal mining industries in and around Penchihu and Kungyuan are to operate again, electric power from this station will be needed. Even if these industries do not again operate in their former capacity, this power could be used elsewhere. The station is ideal from the standpoint of its location being adjacent to a large high grade coal mine for the source of coal.

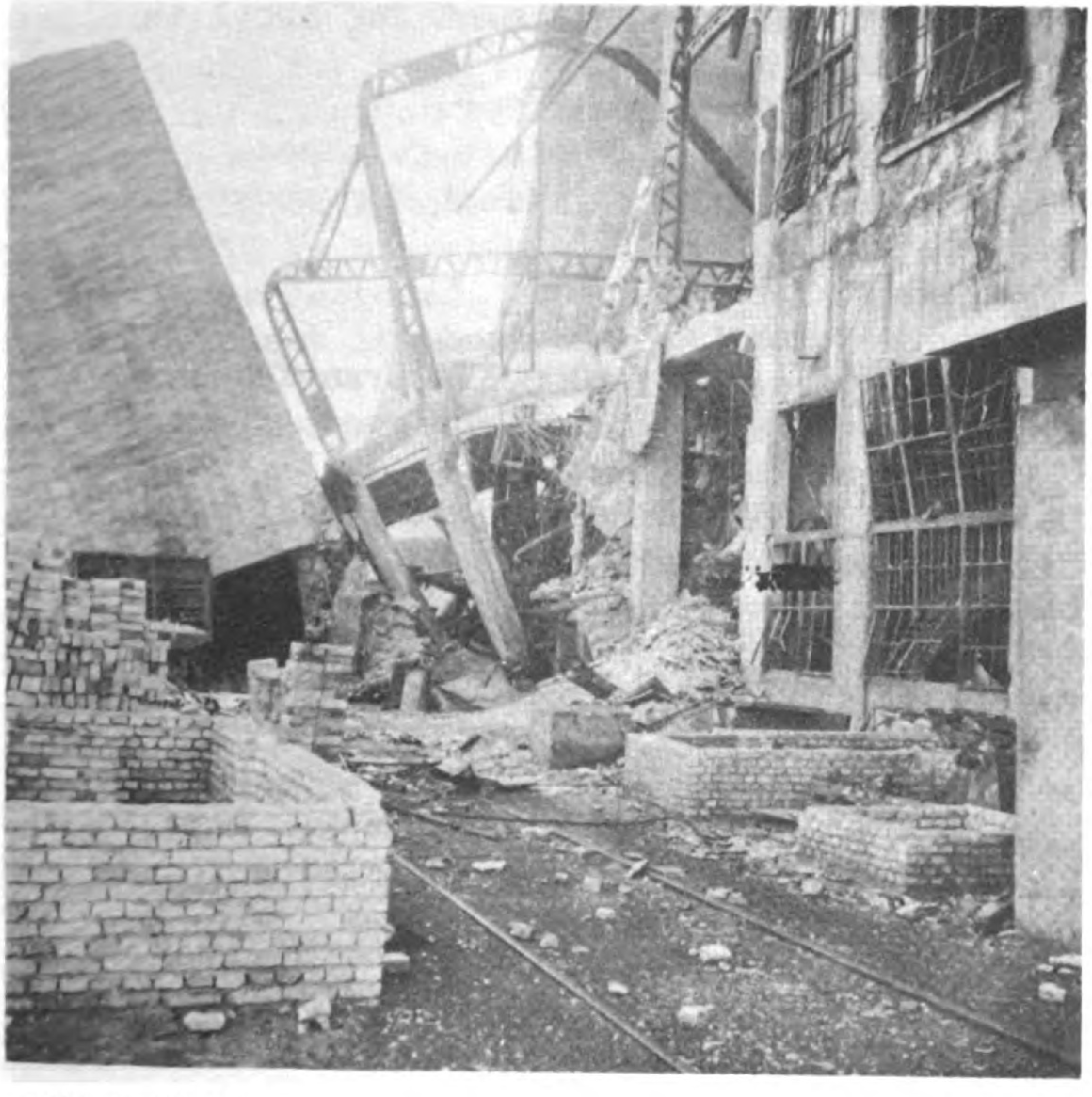
Remarks: The blowing up of this power plant completed the crippling of this area from a power standpoint. Only one small very old plant remains.

PREPARED BY

N. M. Taylor



Manchu Iron Works Power Station #2. No removals were made here but Chinese Communist forces set off explosives in one boiler damaging the entire plant.



Manchu Iron Works Power Station #2. Close-up view of damage caused by Chinese Communist planted charges in a boiler.

# MANCHURIA POWER PLANT AND BLAST FURNACE BLOWERS—STEAM
(Manchu Iron Works Power Station #3)

Location: Kungyuan (Station is a part of and located within Iron Works).

Date Visited: 10 June 1946 by Norman Taylor and John P. Hurndall.

Source and Reliability of Information: Additional information was obtained from Japanese former official and director of the Manchu Iron Works (who was our guide during the inspection) and from the Chinese Northeast Economic Commission. Both of these sources are considered reliable and their information accepted as true.

Date Established: Plant started operations in 1938.

Product: Electric Current—50 cycle and air for adjacent blast furnaces.

Capacity: 40,000 KW generated power plus additional 10,000 KW of outside power with frequency changes. Turbo blowers for blast furnaces - 12,000 H.P.

Equipment:

(a) 2 sets of 20,000 KW steam turbo generators.
(b) Necessary oil feed and auxiliary equipment for above turbines and generators.
(c) One spare turbine for 20,000 KW generator.
(d) 2 sets 6,000 H.P. turbo blowers for blast furnaces.
(e) Necessary oil feed and auxiliary equipment for above turbines and blowers.
(f) One 10,000 KW frequency changer.
(g) One 100 ton power house crane.
(h) Two sets 9000 KVA and two sets of 6000 KVA transformers.
(i) Necessary circuit breakers and control equipment for transformers and generators.
(j) Five sets of boilers - 90—120 tons per hour 25 $Kg/cm^2$—400° C.
(k) Ten sets of ball mill coal pulverizers about 150 tons per hour capacity.

Removals: Of above listed items the Soviets completely removed those appearing under (a), (b), (c), (d), (e), (h), (i), (j), (k). With regard to item (j) the brick shells and water tubes were left but badly damaged in removing the drum headers and firing equipment. Boiler economizers and air heaters were left. Regarding item (i) only about 60 percent of the control equipment was removed.

Destruction: Very little destruction with the exception of that done by the Soviets in removing the equipment from the building. This was greatest in the boiler house.

Capacity: It would be possible and probably necessary to restore this power plant to 100 percent capacity if the adjacent Iron Works are going to operate 100 percent. The amount necessary to a lesser degree would depend upon the percent of restoration of the Iron Works.

Equipment Needed for Restoration: The equipment necessary for 100 percent restoration would be practically a complete power plant with the exception of the 100 ton crane and frequency changer. It might be possible to use some of the remaining 40 percent of control equipment and switch boards. The generator building is in fair shape but the boiler building would have to be reconstructed.

Source of Coal: Coal to operate this plant was obtained from the Penchihu Coal Mine and this source is still available and operating providing electric power is supplied to the mine.

Stockpiles: No stockpiles of coal.

Former Distribution of Power: Power from this plant was used in the Manchu Iron Works itself and for domestic purposes in the Kungyuan workers' homes.

Future Demand for Power: This was one of three steam power plants in the Penchihu-Kungyuan area. Number 3 plant is stripped, number 2 plant has been destroyed and number 1 has been stripped of all but 6,500 KW of generating equipment which is so old and in such bad condition that only 1,500 KW is operating. Therefore power is essential for this area and should be restored. The number 3 power plant could be rebuilt with proper equipment in about one year.

Remarks: This was a very complete removal job. We were informed it was done by the Soviets. The former Japanese official of the Manchu Iron Works and the Chinese Government officials gave us this information. There were chalk signs in Russian in various places in the building and the methods used in removal bear out the truth of these statements.

PREPARED BY

N. M. Taylor

## ANSHAN STEEL WORKS POWERHOUSE
## and BLOWER ROOMS NO. 1 and 2

**Location:** Anshan (about 41°05'N - 122°55'E)

**Date Visited:** 12 June 1946, by Messrs. Taylor and Einig

**Source and Reliability of Information:**

Interview with a former Japanese director of Anshan Steel Works, and data from Northeast Chinese Economic Commission, both of which are considered fairly reliable and their information accepted as true.

**Product:** Electric power 50 cycle and air for blast furnaces

**Capacity:**

| | | |
|---|---|---|
| Powerhouse | | 73,500 KW |
| Blowerhouse | No. 1 | 33,340 HP |
| " | No. 2 | 41,700 HP |

**Equipment:**

**Power Plant:**

(a) One 25,000 KW turbo-generator
(b) One 12,500 KW " "
(c) Two 18,000 KW " "
(d) Necessary oil feed and auxiliary equipment for above turbo-generators.
(e) One 60-ton powerhouse crane
(f) Necessary electric control and switchboard equipment for generators.

**No. 1 Blower Room:**

(a) 3 sets 6100 HP each turbo-blowers
(b) 1 set 4000 HP " "
(c) 1 set 5520 HP " "

***No. 2 Blower Room:**

(a) 3 sets 7350 HP each BBC (Swiss) turbo-blowers
(b) 3 sets 6900 HP " Echer Wyss (German) "

**No. 1 Boiler Room:**

(a) 8 sets 5 T/hr gas fired boilers

---

* Part of generator room.

**No. 2 Boiler Room:**

(a) 4 sets 13 T/hr coal and gas fired boilers
(b) 1 set 25 " " " " "
(c) Coal pulverizers for above 5 boilers

***No. 3 Boiler Room:**

(a) 2 sets 60-45 T/hr coal fired boilers
(b) 4 sets " " " and gas fired boilers
(c) 4 sets 55-40 " gas fired boilers

All of the above boilers are three drum, superheater, water tube type.

(d) Coal pulverizing equipment for 6 boilers

**Transformer Room:**

(a) Three 3000 KVA 3-phase transformers
(b) Necessary circuit breakers and control equipment for transformers.

**Employees:** Japanese 150; Chinese 300.

**Removals:**

**Powerhouse:**

(a) One 25,000 KW turbo-generator) with all auxil-
(b) One 18,000 KW " " ) iary equipment.
(c) Instruments and electric control equipment for above two generators
(d) One 3000 KVA 3-phase transformer

**No. 1 Blower Room:**

(a) 2 sets 6100 HP each turbo-blowers

**No. 2 Blower Room:**

(a) 3 sets 7350 HP each EWC Swiss turbo-blowers
(b) 3 sets 6900 HP " Echer Wyss (German) "

**No. 3 Boiler Room:**

(a) 2 sets 60-45 T/hr coal and gas fired boilers. These were removed completely.
(b) 2 sets 60-45 T/hr coal and gas fired boilers. All firing equipment and controls were removed. Tubes were out in preparation for

---

* Adjacent and attached to powerhouse generator and No. 2 blower room.

removals of drums but drums were not removed. Although parts of these boilers remain they were damaged almost beyond repair during work of removals.

(c) 2 sets 55-40 T/hr gas fired boilers. All firing equipment and controls were removed. The outer shells were torn down and tubes cut in preparation for removal but the drums are still in place. In this case these boilers are practically beyond repair without extensive replacements which would amount to complete rebuilding.

All of the above removals and destruction were accomplished by the Soviets in about one month's time using about 1000 Japanese and Chinese workmen.

Destruction:

The transformer house, including the two 3000 KVA transformers and all circuit breakers and control equipment, was burned by the Chinese Communists. There was a small amount of looting and damage to the remaining generators and their control equipment by the mobs. This was all done after the Soviet removals and damage.

Capacity Considered Practical to Restore:

Two coal fired boilers in boiler room No. 3 which can produce a maximum of 14,000 KV but only 7,000 KV continuously due to necessary maintenance lay up repairs on the boilers. This probably will be the restoration that can be made by the last of October 1946. Additional capacity may be restored up to the 43,000 KV generating capacity left by the Soviets, but this will require time and a great deal of additional equipment for the boilers.

Equipment Needed for Restoration:

To restore to 30,500 KV, there will be needed 4 sets 60-45 T/hr coal fired boilers, two 3000 KVA 3-phase transformers, and electrical control equipment. In addition to these major items many small parts and a good deal of electrical switch board and control equipment will be required.

If it is desired to restore the full generating power of this station which was 73,500 KV, two more 60-45 T/hr coal fired boilers will be needed (making a total of 8 such boilers operating) and also the two lost turbo-generators with a capacity of 43,000 KV, together with one additional 3000 KVA transformer and electrical control equipment for generators and transformers.

The remaining blast furnace here can be supplied with existing blowers but restoration of the original blast furnaces will require two more boilers 60-45 T/hr (total of 10 operating) and 8 blowers totaling 54,950 HP.

Coal to operate this powerhouse came from Fouhsin Coal Mines. For the gas fired boilers, blast furnace and byproduct coke oven gas was obtained from the Anshan Steel Works. For future operation, coal probably can be obtained from Fouhsin providing electric power is available there to operate the mines.

Stockpiles: There were no stockpiles of coal.

Distribution of Power:

Of the former total capacity of 73,000 KW, the Anshan Steel Works used 60,000 KW. The rest was kept as standby. The 69,990 HP blower capacity was used by the Anshan Steel Works in the adjacent blast furnaces.

Immediate Future Demands for Power:

At present all industries in the Anshan area are without power; therefore, all electric power that can be produced by this plant is in great demand.

The amount of blast furnace air needed will depend upon the amount of restoration of the damaged blast furnaces. (See Plant Inspection Report 2-A-1 in Appendix 5--Anshan Steel Works).

This power plant primarily was used to supply current for the steel works. The town and other industries in this area were supplied with current from outside sources such as Fouhsin for steam power and Yalu River for hydroelectric power. Therefore, even though the Anshan steel works is not restored to the point where it would consume all the power from this plant, current generated up to its full former capacity could be used locally because the former outside sources are not available at present, and there is reason to doubt their ability to supply power in the future.

**Remarks:**

This was a typical Soviet removal where the best equipment was taken after a survey to determine what was wanted. The methods used for the actual removals were good except in the case of the boilers where needless damage was caused to adjoining equipment.

PREPARED BY

Norman Taylor

## TAFENGMEN POWER ENGINEERING PROJECT
(hydro-electric)

**Location:** On Sungari River, 12 miles SE of Kirin.

**Source and Reliability of Information:** Visited by John P. Hurndall on July 2, 1946. Information from Japanese sources responsible for the design and building of the dam and power plant, considered reliable. Information as to previous existence of equipment accepted as true and partially confirmed. Information as to Soviet removals accepted as true. Information as to existent equipment confirmed.

**Date Placed in Operation:** Construction of the dam started November 1937, and is now 88.7 per cent complete. Power generation started February 1943.

**Capacity as of August 15, 1945:** Capacity of turbo generators installed, 350,000 kva; capacity of turbo generators under construction, 210,000 kva; capacity of 2-house turbo generators, 1,500 kva each. Total capacity of plant when completed, 563,000 kva. Designed capacity of water reservoir, 11,000,000,000 cubic meters. Surface area of water storage, 550 square km. Circumference of water storage, 2,200 km.

**Equipment as of August 15, 1945:**

(a) Gravity type concrete dam: designed volume of concrete, 1,920,000 cubic meters; present volume of concrete, 1,703,800 cubic meters; height, 91.0 meters; length, 1,080 meters.

(b) Powerhouse, 23 x 200 meters x 28 meters high, containing 8 main turbine rooms, house turbine room, transformer repair room, control panel room, 10 compartment rooms, 4 switching rooms.

(c) Power Generating Equipment: 4 completed and operating vertical axis single flow reaction water turbines at 125 rpm and 115,000 H.P. each; directly connected to alternators of vertical axis type, rotating field, totally enclosed, self-cooling, of 70,000 kva rated output, 13,800 volts, 50 cycles and 125 rpm. Of these, two were Westinghouse generators with Swiss turbines, one being an A. C. (German) generator with Belgium built turbine and the other a Hatachi (Japanese) generator and turbine. 1 completed but not operating turbo generator with above specifications and of Hatachi (Japanese) construstion. 1 turbo generator, under construction, of above specifications, of which the Westinghouse-built generator was in the plant and the Swiss-built turbine had not arrived. 1 turbo generator, under construction, of above specifications, of which both turbine and generator, of German construction, were in the plant but lacked parts which were being made locally. 1 turbo generator, under construction, of above specifications, of which the German-built generator had recently arrived from Germany by submarine, but the turbine was still in Belgium. 2 house turbines, vertical axis single flow directly connected to house alternators of vertical axis, rotating field, totally enclosed, self-cooling type, of 1500 kva rated output each, at

3300 volts, 50 cycle and with a speed of 750 rpm. 3 main transformers, 3 phase core type, forced air cooling of 70,000 kva capacity and voltage of 13.2/220-230 kv. 5 main transformers, 3 phase core type, forced air cooling, of 70,000 kva and voltage of 13.2/154-161 kv.

In addition to the above, there are auxiliary transformers and a vast amount of control equipment, instruments, switching gear, etc.

(d) Penstocks and hydraulic equipment, including intake gates, by-pass valves, main valves, etc.

(e) Construction, mechanical and electrical equipment appropriate for construction enterprise of this type.

(f) Complete detailed inventory of all equipment including the foregoing can be found in Source File 9-L-1.

Removals:

(a) Turbo generators: 2 of the 4 complete and operating turbo generators; 1 turbo generator which was complete and installed but not operating; 1 turbo generator not installed and awaiting the completion of auxiliary equipment; 2 generators which were awaiting the arrival of turbines; all auxiliary equipment on hand for the assembly of the 3 incompleted units; all spare parts for house generators and main generator units.

(b) Main transformers: two 70,000 kva 13.2/220-230 kva transformers; three 70,000 kva 13.2/154-161 kva transformers.

(c) Electrical equipment: control panels for removed generators; large quantity of miscellaneous electrical equipment listed in detail in Source File 9-L-1

(d) Mechanical and construction equipment: large quantity of miscellaneous dam construction and shop equipment as listed in detail in Source File 9-L-1. Included in this are two 9-ton jib cranes and ten 15-ton steam locomotives used in the construction of the dam.

(e) The total operable power capacity removed was 210,000 kva, plus turbo generators for 70,000 kva and alternators for 140,000 kva.

(f) The total operable capacity remaining is 140,000 kva.

(g) All removals were by Soviets and required three weeks time during October 1945.

(h) Detailed inventory of equipment removed will be found in Source File 9-L-1.

Destruction: No destruction to the dam was reported other than the removals by the Soviets. The main bridge below the dam was wrecked, however, by Chinese Communists during the spring of 1946, prior to the arrival of Nationalists forces.

Comments on Restoration: It is essential that the dam be completed to its designed height and imperative that strenghening of the upper section be done prior to early fall this year. Work was started preparatory to pouring concrete on July 2, 1946 by the Chinese Economic Commission. They have for this purpose 2,000 tons of cement which was left in the silos of the Kirin Cement Plant after Soviet removals. Additional cement must be obtained from other sources.

Distribution of Power: Two main transmission lines carry power from the plant. One distributes to Kirin, Changchun, Harbin, and adjoining areas, the other supplies the southern power network of Fushun, Mukden, Penchihu, Anshan, and Fouhsin. One generator is now operating at capacity, 70,000 kva, supplying the Kirin, Changchun, Harbin system. The transmission line supplying the southern network has been cut by the Chinese Communist Army and no power is being transmitted through it. The second remaining generator is at present producing 50,000 kva and discharging into a water rheostat. Could the southern line be repaired and kept open, power could be supplied the power-deficient southern cities and, of great immediate importance, coal mining could be resumed on a scale adequate to provide the winter needs of southern Manchuria.

Present Plant Manager: (official in charge unknown) Chinese Economic Commission.

Names of Soviet Officials Handling Removals: Not determined.

PREPARED BY

J. P. Hurndall

## FOUHSIN POWER PLANT

**Location:** Fouhsin, on property of Fouhsin Coal Mines.

**Date Visited:** 8 June 1946, by Messrs. Cleaveland and Swift.

This report forms a corollary to the Pauley Mission report on the Fouhsin Coal Mines, Jehol Province. The Fouhsin thermal electric power generating plant located on property of the Fouhsin Coal Mine can be easily identified by the unusual physical appearance of its cooling towers.

The plant of 160,000 KW was planned and built by the Manchuria Electric Company with the approval of the puppet government given in March 1935. Construction was started in March 1938 and completed in three stages by November 1942.

The purpose of the plant was (1) to supply power for the Fouhsin Coal Mines; (2) to form the major source of electric power supply for industry developed in Jehol, northern Hopei and lower Liaoning; (3) to form a major generating plant to be integrated with a power network covering industrial Manchuria.

It is noted that the plant never generated or appeared to have demand on its full capacity. It is the writer's opinion that here, as in Korea, the Japanese in their industrial expansion program reached a higher degree of development of power sources than they did industries to consume power.

The plant was owned by the Japanese controlled Manchuria Electric Company which had a monopoly on almost all power in Manchuria. At present the plant is under the control of the Fouhsin Coal Mines. The Nationalist Government has appointed a Chinese engineer as supervisor of the mines. It is noted that he and his staff find it necessary to keep Japanese technicians. See Plant Inspection Report 21-B-1 on Fouhsin mines in Appendix 4. The Nationalist Government also enters as the financing agent for operation and repair of the installations and care of the entire labor supply in the area.

The major items of the power plant are listed in Table 1.

## TABLE 1 -- EQUIPMENT INSTALLED

| Description | 1st Project | 2nd Project | 3rd Project |
|---|---|---|---|
| Turbo-generators | 27,000 K.W. 2 Sets | 53,000 K.W. 1 Set | 53,000 K.W. 1 Set |
| B & W Boilers | 130 T/Hr. 3 " | 130 T/Hr. 3 " | 130 T/Hr. 3 " |
| Transformers | 20,000 K.V.A. 4 " | - | 20,000 K.V.A. 3 " |
|  | 5,000 K.V.A. 4 " | - | - |
| Area Occupied | 4,153 $M^2$ | 2,153 $M^2$ | 2,738 $M^2$ |
| Date Completed | June 1939 | January 1941 | November 1942 |

## TABLE 2 -- THE EXPENSE AND COST OF THE 3 PROJECTS

| Projects | Capacity | Expense | Cost/K.W. Erected | Remarks |
|---|---|---|---|---|
| 1st Project | 54,000 K.W. | $14,580,000 | 270 | Estimated cost at $179/K.W. |
| 2nd Project | 53,000 " | 16,960,000 | 320 |  |
| 3rd Project | 53,000 " | 24,910,000 | 470 |  |
| TOTAL | 160,000 " | $56,450,000 | 353 |  |

## TABLE 3 -- THE COST OF EQUIPMENT AND INSTALLATION

| Descriptions | Expense | Percent |
|---|---|---|
| B.& W. Boilers | $ 12,862,000 | 22.6 |
| Pulverizing Equipments | 4,556,000 | 8.0 |
| Air Preheating | 2,106,000 | 3.7 |
| Draft | 1,537,000 | 2.7 |
| Coal Handling | 3,020,000 | 5.3 |
| Chimney & Flue | 2,164,000 | 3.8 |
| Water Preheating | 1,253,000 | 2.2 |
| Piping and Fitting | 2,506,000 | 4.4 |
| Turbines | 3,930,000 | 6.9 |
| Circulating Water Equipment | 3,246,000 | 5.7 |
| Generators | 3,532,000 | 6.2 |
| Electrical Equipment Accessories | 2,348,000 | 5.0 |
| Sundry Equipments | 3,079,000 | 5.4 |
| Designing Expense | 2,506,000 | 4.4 |
| Freight and Erection | 3,133,000 | 5.5 |
| Land and Buildings | 4,672,000 | 8.2 |
| TOTAL | $ 56,450,000 | 100.0 |

Table 4, gives the power output and coal consumption from 1938 to 1945. It is noted that the peak power demand was 1943 when 476,000,000 kwh were used. Table 5 indicates that while the plant was rated at 160,000 kw, actual output was limited to an operating maximum of 69,000 kw. The average generating rate for 1943 was 55,000 kw. Figures for available water supply and test runs indicate that due to the limited supply of water, the maximum continuous operating capacity was limited to about 55,000 kw, though modification could possible be made to increase this figure. It is noted that certain Chinese reports list the plant at a capacity of 260,000 kw. This figure includes the capacity of two 53,000 turbo-generators which were reportedly stored in the warehouse. There were no boilers, transformers, or buildings in which to install this equipment, nor any known plan to procure or build this additional equipment. In the opinion of the writer, the existence of these turbo-generators does not warrant considering this plant as one of 260,000 kw instead of 160,000 kw capacity.

TABLE 4 -- ANNUAL OUTPUT AND COAL CONSUMPTION 1939 — 1945

| Year | Output in K.W.H. | Coal in Tons | Average Calories in Coal | Heat Utilized* | Coal Used in Kg. per K.W.H. |
|---|---|---|---|---|---|
| 1939 | 90,000,000 | 54,000 | 5,600 | 26.05% | 0.60 |
| 1940 | 183,500,000 | 128,400 | 5,000 | 24.60 | 0.70 |
| 1941 | 332,000,000 | 252,300 | 4,750 | 23.80 | 0.76 |
| 1942 | 353,000,000 | 282,500 | 4,700 | 22.86 | 0.80 |
| 1943 | 476,000,000 | 390,000 | 4,700 | 22.30 | 0.82 |
| 1944 | 395,000,000 | 343,000 | 4,500 | 22.00 | 0.87 |
| 1945 | 234,500,000 | 213,500 | 4,500 | 21.00 | 0.91 |
| TOTAL | 2,064,000,000 | 1,663,700 | | | 0.806 |

$$* \text{ Heat Utilized} = \frac{\text{Output in KWH} \times 860}{\text{Coal in Kg.} \times \text{Average Cal/Kg.}} \times 100$$

TABLE 5 -- ACTUAL OUTPUT IN K.W.

| Generator | Rated K.W. | Actual K.W. | Percent |
|---|---|---|---|
| No. 1 | 27,000 | 6,000 | 22.3 |
| " 2 | 27,000 | 8,000 | 29.7 |
| " 3 | 53,000 | 23,000 | 43.4 |
| " 4 | 53,000 | 32,000 | 60.6 |
| TOTAL | 160,000 | 69,000 | 43.3 |

## TABLE 6 -- COST PER K.W.H. PRODUCED

| Year | Store & Interest<br>4% 7% | Fuel | Operation & Maintenance | Total $ | cents/ K.W.H. |
|---|---|---|---|---|---|
| 1939 | 624,000 | 297,000 | 511,250 | 1,432,250 | 1.592 |
| 1940 | 1,603,800 | 964,000 | 1,056,600 | 3,624,400 | 1.975 |
| 1941 | 3,325,800 | 2,145,000 | 1,401,800 | 6,872,600 | 2.070 |
| 1942 | 3,768,200 | 3,250,000 | 1,721,400 | 8,739,600 | 2.478 |
| 1943 | 6,209,500 | 5,235,000 | 2,342,800 | 13,787,300 | 2.915 |
| 1944 | 6,209,500 | 4,815,000 | 2,710,000 | 13,734,500 | 3.480 |
| 1945 | 3,842,000 | 3,420,000 | 1,816,000 | 9,078,000 | 3.870 |

Table 7 indicates the amount and division of staff and workmen. In 1943, when demand was greatest, a total of 292 men were employed, however, employment rose continually to a maximum of 398 in 1943 though output dropped 50 percent.

## TABLE 7 -- ANNUAL NO. OF STAFF AND WORKMEN 1939-1945

| Year | Staff | Chinese Sub-Staff & Workmen | Staff | Japanese Sub-Staff & Workmen | Total | No./100 K.W. |
|---|---|---|---|---|---|---|
| 1939 | - | 120 | 6 | 39 | 165 | 3.06 |
| 1940 | - | 125 | 7 | 39 | 171 | 3.17 |
| 1941 | 1 | 180 | 8 | 51 | 240 | 2.24 |
| 1942 | 1 | 185 | 10 | 75 | 271 | 1.69 |
| 1943 | 2 | 200 | 14 | 76 | 292 | 1.83 |
| 1944 | 2 | 280 | 18 | 80 | 380 | 2.38 |
| 1945 | 3 | 300 | 24 | 71 | 398 | 2.49 |

There is, in the opinion of the writer, conclusive evidence of removals by Soviet forces from the plant. Local officials indicate that on 26 August 1945 Soviet forces arrived and on 25 September 1945 dismantling of the power plant started on a 24-hour basis. The major items reported taken by Soviets are:

| | | | | |
|---|---|---|---|---|
| Turbo-generators | 27,000 | K.W. | | 2 Sets |
| | 53,000 | " | | 4 " (Including 2 spare sets) |
| B. & W. Boilers | 130 | T/H | | 9 " |
| Transformers | 20,000 | K.V.A. | 15.4 KV/11KV | 4 " |
| | 3,750 | " | 11KV/3.5KV | 1 " |
| | 3,000 | " | 11KV/3.3KV | 1 " |
| | 300 | " | 3300/220V | 2 " |
| | 300 | " | 3300/110V | 1 " |

| | | | |
|---|---|---|---|
| Feed Pumps | Motor Driven | 550 H.P. | 2 Sets |
| | Steam Driven | 600 H.P. | 1 " |
| | Motor Dirven | 800 H.P. | 5 " |

Soviet forces withdrew about the end of November 1945.

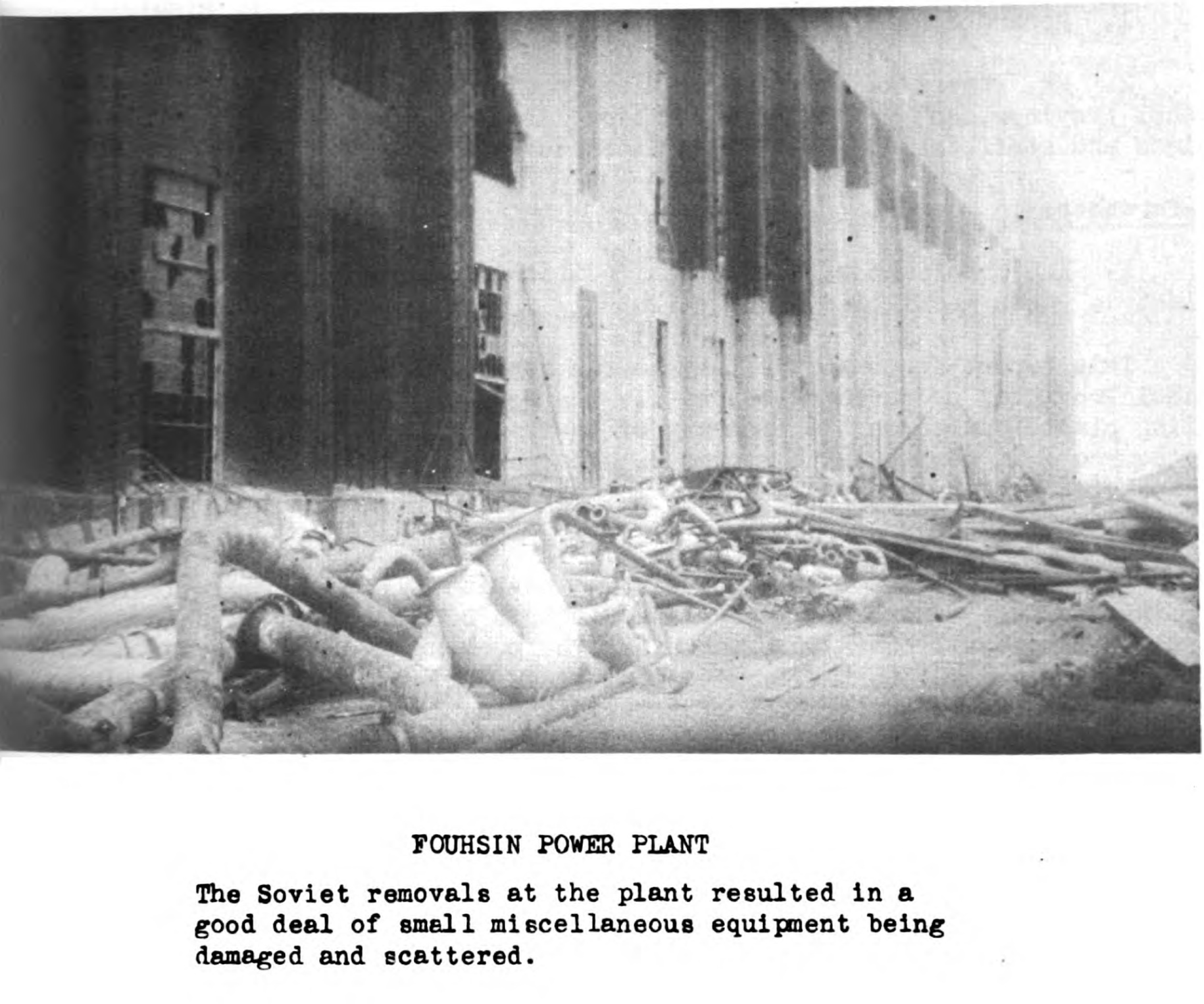
The writer observed the former locations of two 27,000 kw and two 53,000 kw turbo-generators. It can be stated that equipment had been removed from four foundations each about 30 feet long. Connecting piping was in place in some instances and disconnected piping and parts were lying about. A hole had been made in the side of the building and a railroad track laid extending inside the building. Two cylindrical pieces of cast iron about 10 feet diameter believed to be turbine rotor casings had been moved and were still remaining beside the railroad tracks. Two of the same pieces of equipment were observed loaded on a flat car on a spur beside the building. Within the building were several sheet steel shapes about 10' x 5' x 5' of about 3/8" steel, believed to be part of the condensor system which had been cut from their installed position by blow torch. Eight boilers were located in the same building. The frames of the boilers and about 50 percent of the tubes and an associated piping were observed in place. Grates, blowers, some tubes, and other parts of boilers were missing. Two or three holes besides the rail entry had been knocked out of the brick wall of the building apparently to facilitate removal of equipment. An estimated 10 percent of the plant machinery lay about the floor of the building and outside the building. A rough estimate of 50 percent of this equipment was broken. In the control room one control panel about 30 feet long had been removed and one panel of about 30 feet in length remained intact. The cooling towers were intact. In the transformer yard, four 20,000 kw transformers had been removed but three 20,000 kw transformers remained. Less than 50 percent of the switches and bus bars had been removed. Russian writing was observed on a control panel.

The writer digresses here to comment that his impression was that removals had been made in a disorderly manner. The relatively high percentage of broken equipment and abandonment of essential parts of machines, such as what are believed to be all the turbine rotor cases, will reduce materially the value to the Soviets of the removed material.

No effort has been initiated to rehabilitate this plant in view of the heavy replacements needed. The coal mines are operating on 25,000 KWH/day, distributed from Chinchow. Lack of power is the major factor preventing an increase in output from the coal mines over the current 2,000 T/day.

PREPARED BY

Carleton B. Swift.



FOUHSIN POWER PLANT

The Soviet removals at the plant resulted in a good deal of small miscellaneous equipment being damaged and scattered.

27

# FOUHSIN POWER PLANT

**Location:** Fouhsin, on property of Fouhsin Coal Mines.

**Date Visited:** 8 June 1946, by Messrs. Cleaveland and Swift.

This report forms a corollary to the Pauley Mission report on the Fouhsin Coal Mines, Jehol Province. The Fouhsin thermal electric power generating plant located on property of the Fouhsin Coal Mine can be easily identified by the unusual physical appearance of its cooling towers.

The plant of 160,000 KW was planned and built by the Manchuria Electric Company with the approval of the puppet government given in March 1935. Construction was started in March 1938 and completed in three stages by November 1942.

The purpose of the plant was (1) to supply power for the Fouhsin Coal Mines; (2) to form the major source of electric power supply for industry developed in Jehol, northern Hopei and lower Liaoning; (3) to form a major generating plant to be integrated with a power network covering industrial Manchuria.

It is noted that the plant never generated or appeared to have demand on its full capacity. It is the writer's opinion that here, as in Korea, the Japanese in their industrial expansion program reached a higher degree of development of power sources than they did industries to consume power.

The plant was owned by the Japanese controlled Manchuria Electric Company which had a monopoly on almost all power in Manchuria. At present the plant is under the control of the Fouhsin Coal Mines. The Nationalist Government has appointed a Chinese engineer as supervisor of the mines. It is noted that he and his staff find it necessary to keep Japanese technicians. See Plant Inspection Report 21-B-1 on Fouhsin mines in Appendix 4. The Nationalist Government also enters as the financing agent for operation and repair of the installations and care of the entire labor supply in the area.

The major items of the power plant are listed in Table 1.

## TABLE 1 -- EQUIPMENT INSTALLED

| Description | 1st Project | 2nd Project | 3rd Project |
|---|---|---|---|
| Turbo-generators | 27,000 K.W. 2 Sets | 53,000 K.W. 1 Set | 53,000 K.W. 1 Set |
| B & W Boilers | 130 T/Hr. 3 " | 130 T/Hr. 3 " | 130 T/Hr. 3 " |
| Transformers | 20,000 K.V.A. 4 " | - | 20,000 K.V.A. 3 " |
| | 5,000 K.V.A. 4 " | - | - |
| Area Occupied | 4,153 $M^2$ | 2,153 $M^2$ | 2,738 $M^2$ |
| Date Completed | June 1939 | January 1941 | November 1942 |

## TABLE 2 -- THE EXPENSE AND COST OF THE 3 PROJECTS

| Projects | Capacity | Expense | Cost/K.W. Erected | Remarks |
|---|---|---|---|---|
| 1st Project | 54,000 K.W. | $14,580,000 | 270 | Estimated cost at $179/K.W. |
| 2nd Project | 53,000 " | 16,960,000 | 320 | |
| 3rd Project | 53,000 " | 24,910,000 | 470 | |
| TOTAL | 160,000 " | $56,450,000 | 353 | |

## TABLE 3 -- THE COST OF EQUIPMENT AND INSTALLATION

| Descriptions | Expense | Percent |
|---|---|---|
| B.& W. Boilers | $ 12,862,000 | 22.6 |
| Pulverizing Equipments | 4,556,000 | 8.0 |
| Air Preheating | 2,106,000 | 3.7 |
| Draft | 1,537,000 | 2.7 |
| Coal Handling | 3,020,000 | 5.3 |
| Chimney & Flue | 2,164,000 | 3.8 |
| Water Preheating | 1,253,000 | 2.2 |
| Piping and Fitting | 2,506,000 | 4.4 |
| Turbines | 3,930,000 | 6.9 |
| Circulating Water Equipment | 3,246,000 | 5.7 |
| Generators | 3,532,000 | 6.2 |
| Electrical Equipment Accessories | 2,348,000 | 5.0 |
| Sundry Equipments | 3,079,000 | 5.4 |
| Designing Expense | 2,506,000 | 4.4 |
| Freight and Erection | 3,133,000 | 5.5 |
| Land and Buildings | 4,672,000 | 8.2 |
| TOTAL | $ 56,450,000 | 100.0 |

Table 4, gives the power output and coal consumption from 1938 to 1945. It is noted that the peak power demand was 1943 when 476,000,000 kwh were used. Table 5 indicates that while the plant was rated at 160,000 kw, actual output was limited to an operating maximum of 69,000 kw. The average generating rate for 1943 was 55,000 kw. Figures for available water supply and test runs indicate that due to the limited supply of water, the maximum continuous operating capacity was limited to about 55,000 kw, though modification could possible be made to increase this figure. It is noted that certain Chinese reports list the plant at a capacity of 260,000 kw. This figure includes the capacity of two 53,000 turbo-generators which were reportedly stored in the warehouse. There were no boilers, transformers, or buildings in which to install this equipment, nor any known plan to procure or build this additional equipment. In the opinion of the writer, the existence of these turbo-generators does not warrant considering this plant as one of 260,000 kw instead of 160,000 kw capacity.

TABLE 4 — ANNUAL OUTPUT AND COAL CONSUMPTION 1939 — 1945

| Year | Output in K.W.H. | Coal in Tons | Average Calories in Coal | Heat Utilized* | Coal Used in Kg. per K.W.H. |
|---|---|---|---|---|---|
| 1939 | 90,000,000 | 54,000 | 5,600 | 26.05% | 0.60 |
| 1940 | 183,500,000 | 128,400 | 5,000 | 24.60 | 0.70 |
| 1941 | 332,000,000 | 252,300 | 4,750 | 23.80 | 0.76 |
| 1942 | 353,000,000 | 282,500 | 4,700 | 22.86 | 0.80 |
| 1943 | 476,000,000 | 390,000 | 4,700 | 22.30 | 0.82 |
| 1944 | 395,000,000 | 343,000 | 4,500 | 22.00 | 0.87 |
| 1945 | 234,500,000 | 213,500 | 4,500 | 21.00 | 0.91 |
| TOTAL | 2,064,000,000 | 1,663,700 | | | 0.806 |

$$* \text{ Heat Utilized} = \frac{\text{Output in KWH} \times 860}{\text{Coal in Kg.} \times \text{Average Cal/Kg.}} \times 100$$

TABLE 5 -- ACTUAL OUTPUT IN K.W.

| Generator | Rated K.W. | Actual K.W. | Percent |
|---|---|---|---|
| No. 1 | 27,000 | 6,000 | 22.3 |
| " 2 | 27,000 | 8,000 | 29.7 |
| " 3 | 53,000 | 23,000 | 43.4 |
| " 4 | 53,000 | 32,000 | 60.6 |
| TOTAL | 160,000 | 69,000 | 43.3 |

## TABLE 6 -- COST PER K.W.H. PRODUCED

| Year | Store & Interest 4% 7% | Fuel | Operation & Maintenance | Total $ | cents/ K.W.H. |
|---|---|---|---|---|---|
| 1939 | 624,000 | 297,000 | 511,250 | 1,432,250 | 1.592 |
| 1940 | 1,603,800 | 964,000 | 1,056,600 | 3,624,400 | 1.975 |
| 1941 | 3,325,800 | 2,145,000 | 1,401,800 | 6,872,600 | 2.070 |
| 1942 | 3,768,200 | 3,250,000 | 1,721,400 | 8,739,600 | 2.478 |
| 1943 | 6,209,500 | 5,235,000 | 2,342,800 | 13,787,300 | 2.915 |
| 1944 | 6,209,500 | 4,815,000 | 2,710,000 | 13,734,500 | 3.480 |
| 1945 | 3,842,000 | 3,420,000 | 1,816,000 | 9,078,000 | 3.870 |

Table 7 indicates the amount and division of staff and workmen. In 1943, when demand was greatest, a total of 292 men were employed, however, employment rose continually to a maximum of 398 in 1943 though output dropped 50 percent.

## TABLE 7 — ANNUAL NO. OF STAFF AND WORKMEN 1939-1945

| Year | Staff | Chinese Sub-Staff & Workmen | Staff | Japanese Sub-Staff & Workmen | Total | No./100 K.W. |
|---|---|---|---|---|---|---|
| 1939 | - | 120 | 6 | 39 | 165 | 3.06 |
| 1940 | - | 125 | 7 | 39 | 171 | 3.17 |
| 1941 | 1 | 180 | 8 | 51 | 240 | 2.24 |
| 1942 | 1 | 185 | 10 | 75 | 271 | 1.69 |
| 1943 | 2 | 200 | 14 | 76 | 292 | 1.83 |
| 1944 | 2 | 280 | 18 | 80 | 380 | 2.38 |
| 1945 | 3 | 300 | 24 | 71 | 398 | 2.49 |

There is, in the opinion of the writer, conclusive evidence of removals by Soviet forces from the plant. Local officials indicate that on 26 August 1945 Soviet forces arrived and on 25 September 1945 dismantling of the power plant started on a 24-hour basis. The major items reported taken by Soviets are:

| | | | | |
|---|---|---|---|---|
| Turbo-generators | 27,000 K.W. | | 2 Sets | |
| | 53,000 " | | 4 " | (Including 2 spare sets) |
| B. & W. Boilers | 130 T/H | | 9 " | |
| Transformers | 20,000 K.V.A. | 15.4 KV/11KV | 4 " | |
| | 3,750 " | 11KV/3.5KV | 1 " | |
| | 3,000 " | 11KV/3.3KV | 1 " | |
| | 300 " | 3300/220V | 2 " | |
| | 300 " | 3300/110V | 1 " | |

| | | | |
|---|---|---|---|
| Feed Pumps | Motor Driven | 550 H.P. | 2 Sets |
| | Steam Driven | 600 H.P. | 1 " |
| | Motor Dirven | 800 H.P. | 5 " |

Soviet forces withdrew about the end of November 1945.

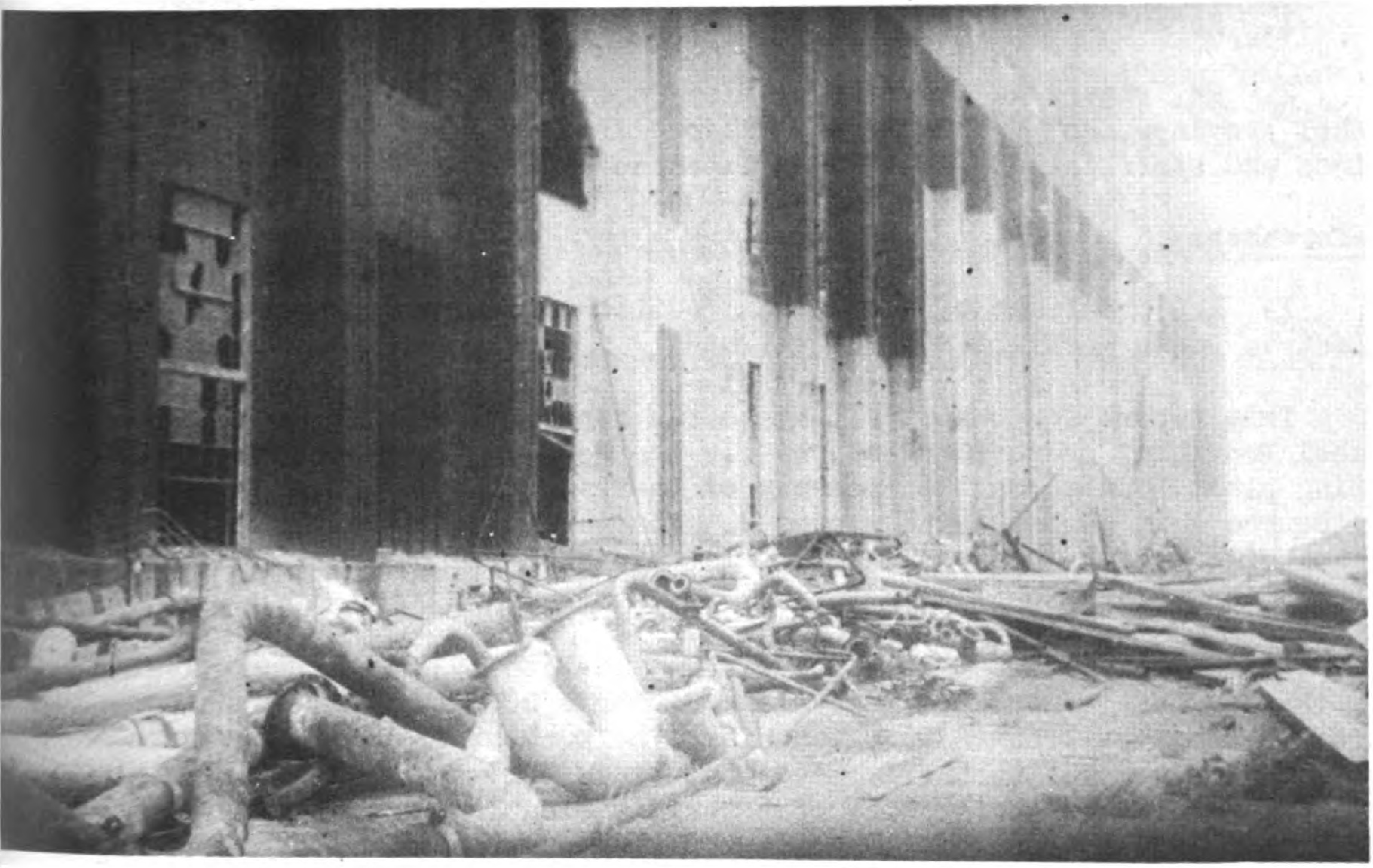
The writer observed the former locations of two 27,000 kw and two 53,000 kw turbo-generators. It can be stated that equipment had been removed from four foundations each about 30 feet long. Connecting piping was in place in some instances and disconnected piping and parts were lying about. A hole had been made in the side of the building and a railroad track laid extending inside the building. Two cylindrical pieces of cast iron about 10 feet diameter believed to be turbine rotor casings had been moved and were still remaining beside the railroad tracks. Two of the same pieces of equipment were observed loaded on a flat car on a spur beside the building. Within the building were several sheet steel shapes about 10' x 5' x 5' of about 3/8" steel, believed to be part of the condensor system which had been cut from their installed position by blow torch. Eight boilers were located in the same building. The frames of the boilers and about 50 percent of the tubes and an associated piping were observed in place. Grates, blowers, some tubes, and other parts of boilers were missing. Two or three holes besides the rail entry had been knocked out of the brick wall of the building apparently to facilitate removal of equipment. An estimated 10 percent of the plant machinery lay about the floor of the building and outside the building. A rough estimate of 50 percent of this equipment was broken. In the control room one control panel about 30 feet long had been removed and one panel of about 30 feet in length remained intact. The cooling towers were intact. In the transformer yard, four 20,000 kw transformers had been removed but three 20,000 kw transformers remained. Less than 50 percent of the switches and bus bars had been removed. Russian writing was observed on a control panel.

The writer digresses here to comment that his impression was that removals had been made in a disorderly manner. The relatively high percentage of broken equipment and abandonment of essential parts of machines, such as what are believed to be all the turbine rotor cases, will reduce materially the value to the Soviets of the removed material.

No effort has been initiated to rehabilitate this plant in view of the heavy replacements needed. The coal mines are operating on 25,000 KWH/day, distributed from Chinchow. Lack of power is the major factor preventing an increase in output from the coal mines over the current 2,000 T/day.

PREPARED BY

Carleton B. Swift.



FOUHSIN POWER PLANT

The Soviet removals at the plant resulted in a good deal of small miscellaneous equipment being damaged and scattered.

# PEIPIAO ELECTRIC POWER PLANT

Location: Peipiao, on property of Peipiao Coal Mine.

Date Visited: 9 June 1946

Sources:

1. Reparations Mission - Mr. Norman Cleaveland and Mr. C. B. Swift, Jr.

2. Mr. Powers A. Lay, Nationalist Commissioner of Coal Mines for Jehol Province, and Mr. C. T. Wu, Nationalist manager of the Peipiao Coal Mines and staff including 4 former Japanese staff.

References:

1. AMS proof map of provisional edition of "Manchuria Principal Electric Power Facilities of July 1945"

This report forms a corollary to the report of the Peipiao Coal Mines, Jehol Province, prepared by source 1. The Peipiao thermal electric generating plant located on the property of the Peipiao Coal Mine was surveyed by source 1 in company with source 2. The water cooling tower in the shape of a hyperbola of revolution distinguishes the building from all others in the area.

The plant of 15,000 kw was built in the late 1930's or early 1940's by the Japanese controlled Manchurian Electric Company which is in control of almost all power in Manchuria. The purpose of the plant was (1) to supply power to the Peipiao Coal Mines; (2) to form a minor generating station in the network of power distribution covering industrial Manchuria. See reference 1. Since the mine can use all the generated power, transmission lines tying into the main complex appear to be for emergency use.

The plant has never operated at a capacity greater than 6,000 kw. This was reportedly due to the use of a poor grade of coal in the boilers. By using better grade coal it is hoped to increase output possibly to 10,000 kw.

The plant is now operated under the management of the Peipiao Mines. Here the Nationalist Government has appointed a Chinese supervisor to operate the mine and a limited staff. Japanese are being retained in staff positions. The Nationalist Government is financing repairs and through the mine staff caring for labor.

Power equipment in the generating house consists of

2 Japanese make boilers
1 15,000 kw turbo-generator (12,000 kw operating load
- transformers

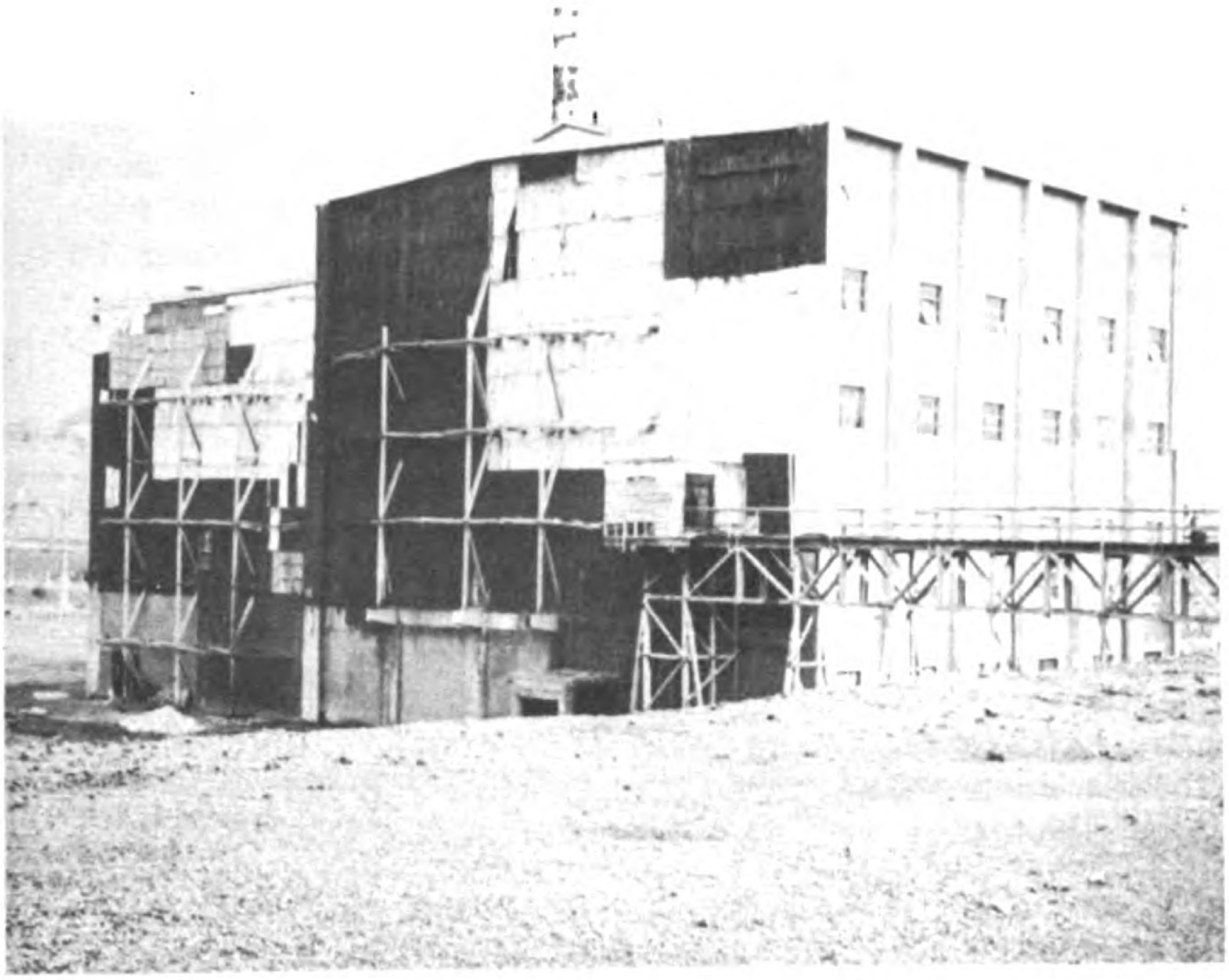
The only transmission line from the plant runs southeast to Ihsien where it ties into the line from Fouhsin to Chinchow. Along this line Chinese Communists had blasted and toppled towers. No effort was being made to put the line back in operating condition due primarily to its vulnerability to subsequent attack and also lack of available power to import.

There was no evidence of removals from the power plant and none claimed by source 2. In a Chinese Communist raid of 13 May, charges had been set off in the generator between the armature and field coils and in the condenser, and the governors and some small parts were taken. This damage was being repaired and the plant is expected to be in operation in a few months.

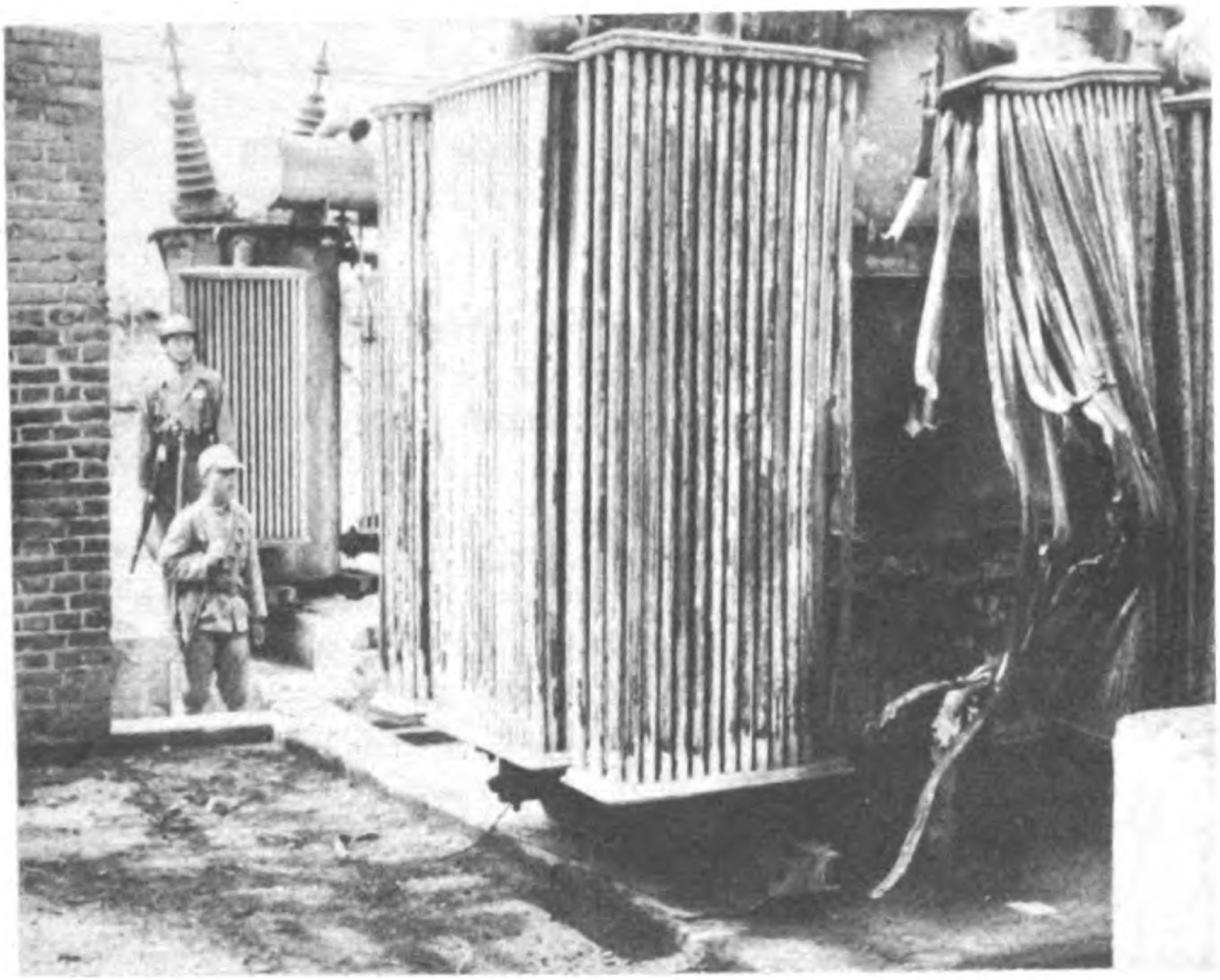
Lack of power was reported as the major deterrent to increased production in the mine. An old 1,000 kw generator located in the old plant buildings was being used which permitted mining 250 tons per day. This coal went for coal allowance to labor and for operating the plant. No exportable coal was being produced.

PREPARED BY

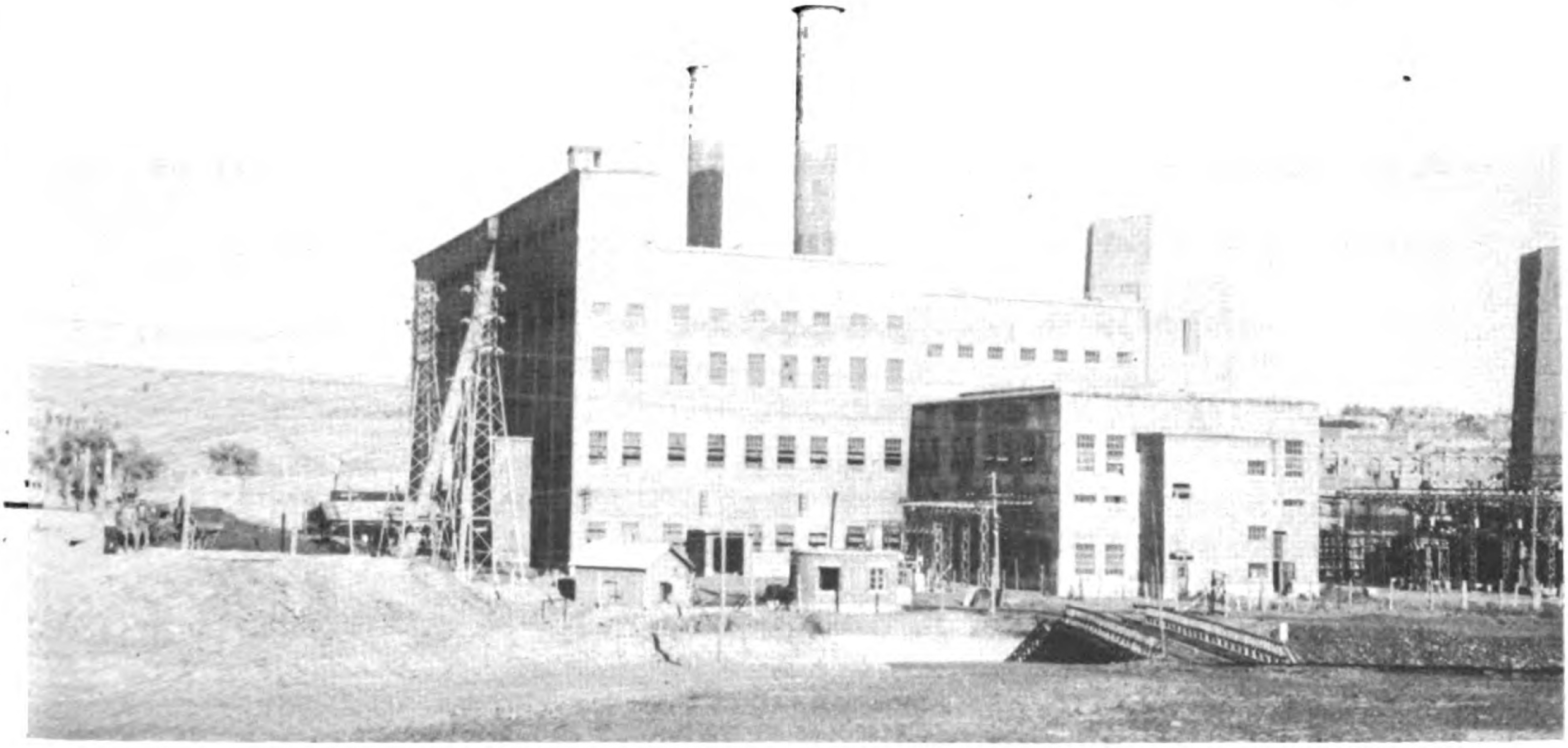
C. B. Swift, Jr.



Peipiao Power Plant of 15,000 kw, serving the Peipiao Coal Mines in Jehol. No removals were made here but Chinese Communists effected minor damage in May, 1946.



Substation at Peipiao for incoming power. Damaged beyond repair by Chinese Communist explosives in May, 1946.



Hsian Power Plant--30,000 kw--operated in connection with the Hsian Coal Mines. At this plant only plant supplies were removed.

Appendix 3

## INDIVIDUAL ELECTRIC POWER PLANT SUMMARY REPORTS

The following individual plant summary reports list separately all power plants in Manchuria and Jehol giving technical data on equipment, plant performance, removals and comments on present condition. All available sources, including Pauley Mission Plant Inspection Reports, were utilized in an effort to prepare as complete and detailed a listing as possible. Sources have been indicated in order to permit evaluation of the information.

# POWER PLANTS IN KWANGTUNG LEASED TERRITORY

## MEC PLANTS:

Amanogawa
Kanchingtze

## NON MEC PLANTS:

Kwantung Cement Company

# AMANOGAWA (Tienchinchuan)

| | |
|---|---|
| LOCATION: | Dairen |
| Province | Kwantung Leased Territory |
| Latitude | 38° 56' |
| Longitude | 121° 39' |
| OWNER: | MEC |
| ERECTION DATE: | 1930-1931 |
| EQUIPMENT: | |
| Rated capacity | 31,280 kw |
| Normal operating capacity | 10,000 kw |
| Operating capacity 1944-45 | 10,000 kw |

TURBO-GENERATORS:

| Number | KW | KV | TYPE | TYPE |
|---|---|---|---|---|
| 1 | 15,640 | 11 | 3 cyl. double flow | BBC |
| 1 | 15,640 | 11 | 2 cyl. single flow | Mitsubishi |

BOILERS:

| No. | Cap. T/hr | Steam Pressure kg/sq.cm. | Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 39 | 34 | 425 | CTM | B&W | Pulverized Coal |

REMOVALS:
No Information.

| | |
|---|---|
| CAPACITY REMAINING: | 31,280 kw |
| CAPACITY OPERATIVE | 10,000 kw |
| SOURCE: | MEC officials in Changchun, July 1946. |
| REMARKS: | It was the intention of MEC to take this plant out of operation. Boiler capacity was low. |

# KANCHINGTZE

**LOCATION:**

| | |
|---|---|
| Province | Dairen |
| Latitude | 38° 55' |
| Longitude | 121° 39' |

**OWNER:** MEC

**ERECTION DATE:** 1934-1941

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 83,500 kw |
| Normal operating capacity | 53,000 kw |
| Operating capacity 1944-45 | 53,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | TYPE | Maker |
|---|---|---|---|---|
| 1 | 25,000 | 11 | 3 cyl. double flow | BBC |
| 1 | 25,000 | 11 | 2 " " " | Mitsubishi |
| 1 | 25,000 | 11 | 2 " " " | Seimans |
| 1 | 4,000 | 3.3 | 1 " back pressure | AEG |
| 1 | 4,000 | 3.3 | 1 " " " | SS & Kawasaki |

**BOILERS:**

| No. | Cap. T/hr | Steam Pressure kg/sq.cm. | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 140 | 34 | 440 | Sectional | Mitsubishi | Pulverized Coal |
| 3 | 120 | 34 | 440 | CTM | B & W | " " |

**REMOVALS:**

MEC officials state 50,000 kw, confirmed by Chinese Economic Commission
Two 25,000 kw turbo-generators.
Two 120 T/hr boilers.
Auxiliary equipment for above and all spare parts.

**CAPACITY REMAINING:** Probably 33,000 kw

**CAPACITY OPERATIVE:** Probably 20,000 kw

**SOURCE:** MEC officials in Changchun and Chinese Economic Commission, July 1946

**REMARKS:** Turbine blades of the BBC machine were broken. Replacement blades were ready but not shipped from BBC.

# KWANTUNG ONADA CEMENT COMPANY

| | |
|---|---|
| **LOCATION:** | |
| Province | Kwantung Leased Territory |
| Latitude | 38° 56' |
| Longitude | 121° 39' |
| **OWNER:** | Kwantung Onada Cement Company |
| **ERECTION DATE:** | From 1909 onward |
| **EQUIPMENT:** | |
| Rated capacity: | 5,200 |
| Turbo-generators | one 3,600 kw<br>one 1,600 kw |
| Boilers: | |
| Firing: waste gas | |
| **REMOVALS:** | Probably none |
| **CAPACITY REMAINING:** | Probably 5,200 kw |
| **CAPACITY OPERATIVE:** | Estimated 2,900 kw |
| **SOURCE:** | MEC officials and cement association officials<br>Changchun, July 1946 |
| **REMARKS:** | See file on cement industry, 301-H-1 |

# POWER PLANTS OF LIAONING PROVINCE

## MEC PLANTS:

### Greater than 1,000 kw:

Erhtaochiang
Fushun Coal Mines
Hsian
Kaiyuan
Suiho
Taoan
Tiehchangtzu
Tienshihfu
Tungliao

### Less than 1,000 kw:

Faku
Kaitung
Taonan

## NON-MEC PLANTS:

Anshan Steel Works, Anshan
Manchu Iron Works, Plants 1, 2 and 3, Penchihu
Antung Cement Co., Antung
Manchu Onada Cement Co., Chuantou
Manchu Asano Cement Co., Chinhsien
Manchu Iwaki Cement Co., Liaoyang
Manchu Iwaki Cement Co., Penchihu
Manchu Iwaki Cement Co., Kunyuan, Penchihu
Army Fuel Depot, Chinhsi
Synthetic Fuels Co., Chinhsien
Mukden Cotton Spinning Co., Mukden
Yingkow Spinning Co., Yingkow
Mukden Arsenal, Mukden

# ERHTAOCHIANG

| | |
|---|---|
| LOCATION: | Tunghua |
| Province | Liaoning |
| Latitude | 41° 41' |
| Longitude | 125° 55' |
| OWNER: | MEC |
| ERECTION DATE: | 1941-1944 |
| EQUIPMENT: | |
| Rated capacity | 37,500 kw |
| Normal operating capacity | 30,000 kw |
| Operating capacity 1944-45 | 30,000 kw |

TURBO-GENERATORS:

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 15,000 | 5.5 | 1 cyl. single flow | SS & AECT |
| 1 | 7,500 | 11 | 1 Lungstrom | Mitsubishi |

BOILERS:

| No. | Cap. T/hr. | Steam Pressure kg/sq.cm. | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 100 | 38 | 440 | Yallow | Hitachi | Pulverized Coal |
| 1 | 55 | 34 | 425 | CTM | B&W | |

| | |
|---|---|
| REMOVALS: | Chinese Economic Commission states<br>37,500 kw -- Not considered reliable.<br>Two 15,000 kw<br>One 7,500 kw |
| CAPACITY REMAINING: | Possibly 37,500 |
| CAPACITY OPERATIVE: | Possibly 30,000 |
| SOURCE: | MEC officials in Changchun and Chinese Economic Commission, July 1946 |
| REMARKS: | Some of the turbine blades on the 15,000 kw machines are broken. |

# FUSHUN COAL MINES

| | |
|---|---|
| **LOCATION:** | Fushun |
| Province | Liaoning |
| Latitude | 41° 52' |
| Longitude | 123° 53' |
| | |
| **ERECTION DATE:** | 1921-1941 |
| | |
| **EQUIPMENT:** | |
| Rated capacity | 285,000 kw |
| Normal operating capacity | 190,000 kw |
| Operating capacity 1944-45 | 90,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 12,500 | 11(60 cycle) | Single cyl. single flow | GE |
| 1 | 12,500 | 11(60 " ) | double " " " | SS&Mitsubishi |
| 2 | 25,000 | 11(60 " ) | single " " " | Mitsubishi |
| 2 | 25,000 | 11(50 " ) | double " double " | " |
| 3 | 50,000 | 11(50 " ) | " " triple " | " |
| 1 | 10,000 | 11(50 " ) | single " single " | " |

**BOILERS:**

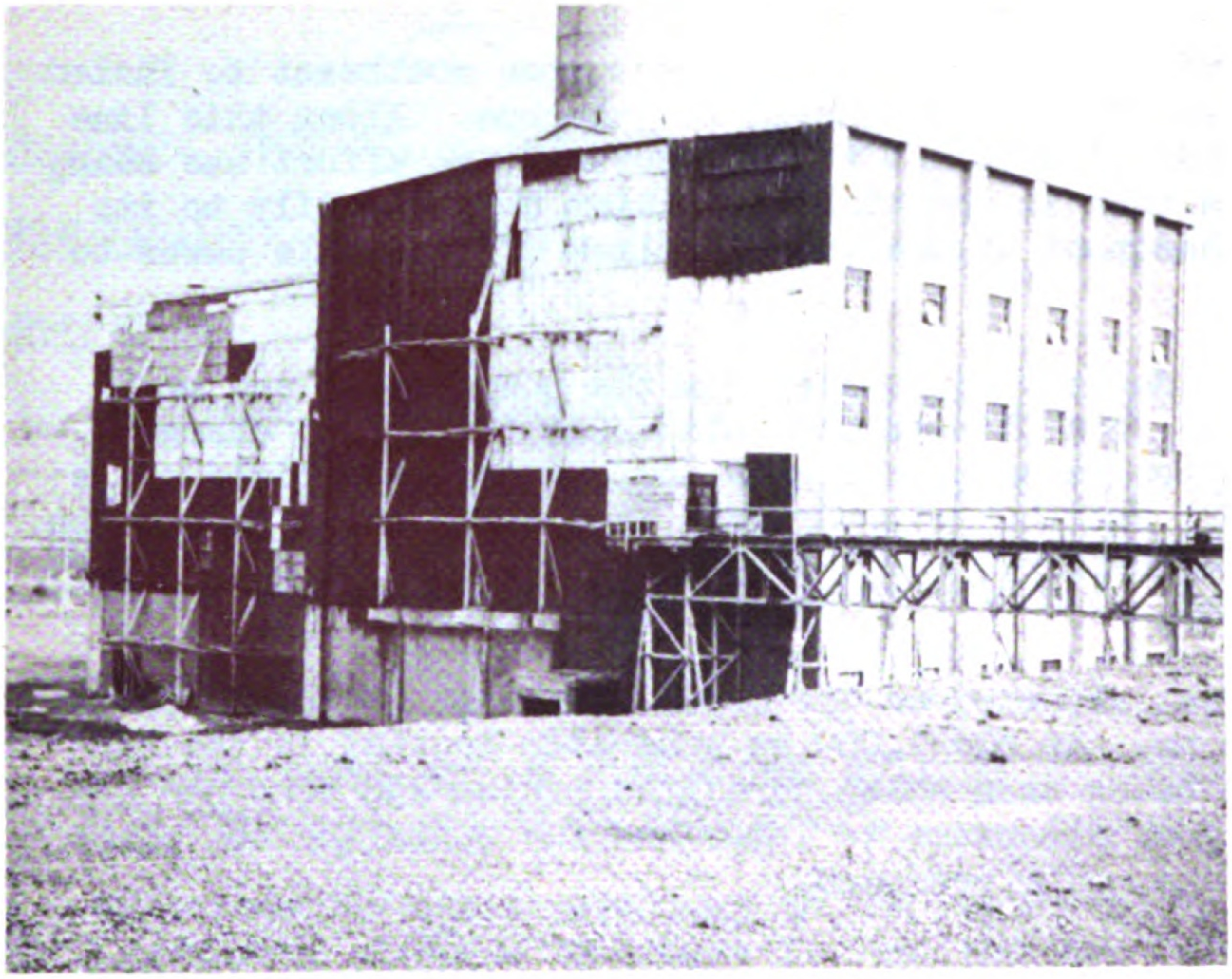
| No. | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 20 | 17.6 | 316 | WIF | B&W | Stoker |
| 3 | 66 | 27.5 | 400 | CTM | B&W | " |
| 2 | 60 | 27.5 | 425 | CTM | B&W | " |
| 7 | 120 | 27.5 | 425 | CTM | B&W | Pulverized coal |

**REMOVALS:**
210,000 kw
2 - 25,000 kw turbo-generators
3 - 50,000 " "
1 - 10,000 " "
5 boilers 120 T/m B&W
1 - 12,000 kva transformer
Auxiliary equipment for turbo-generators and boilers
4 - 20,000 kva transformers
6 sets switchboards & control eqpt.

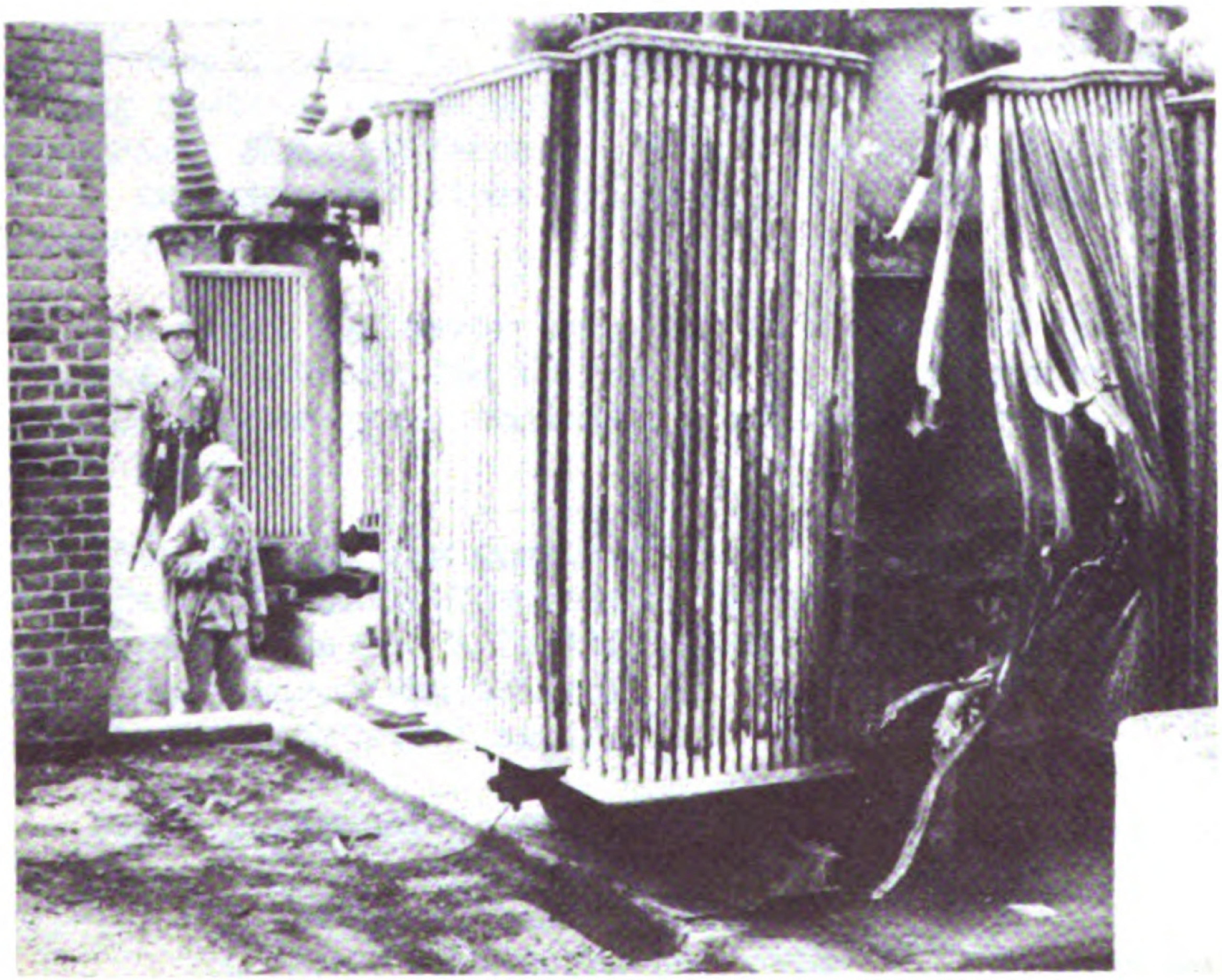
**CAPACITY REMAINING:** 75,000 kw

**CAPACITY OPERATIVE:** 25,000 kw (2-25,000 kw units are operating at half capacity producing 25,000 kw. 2 old 12,500 have not yet been put back in operation).

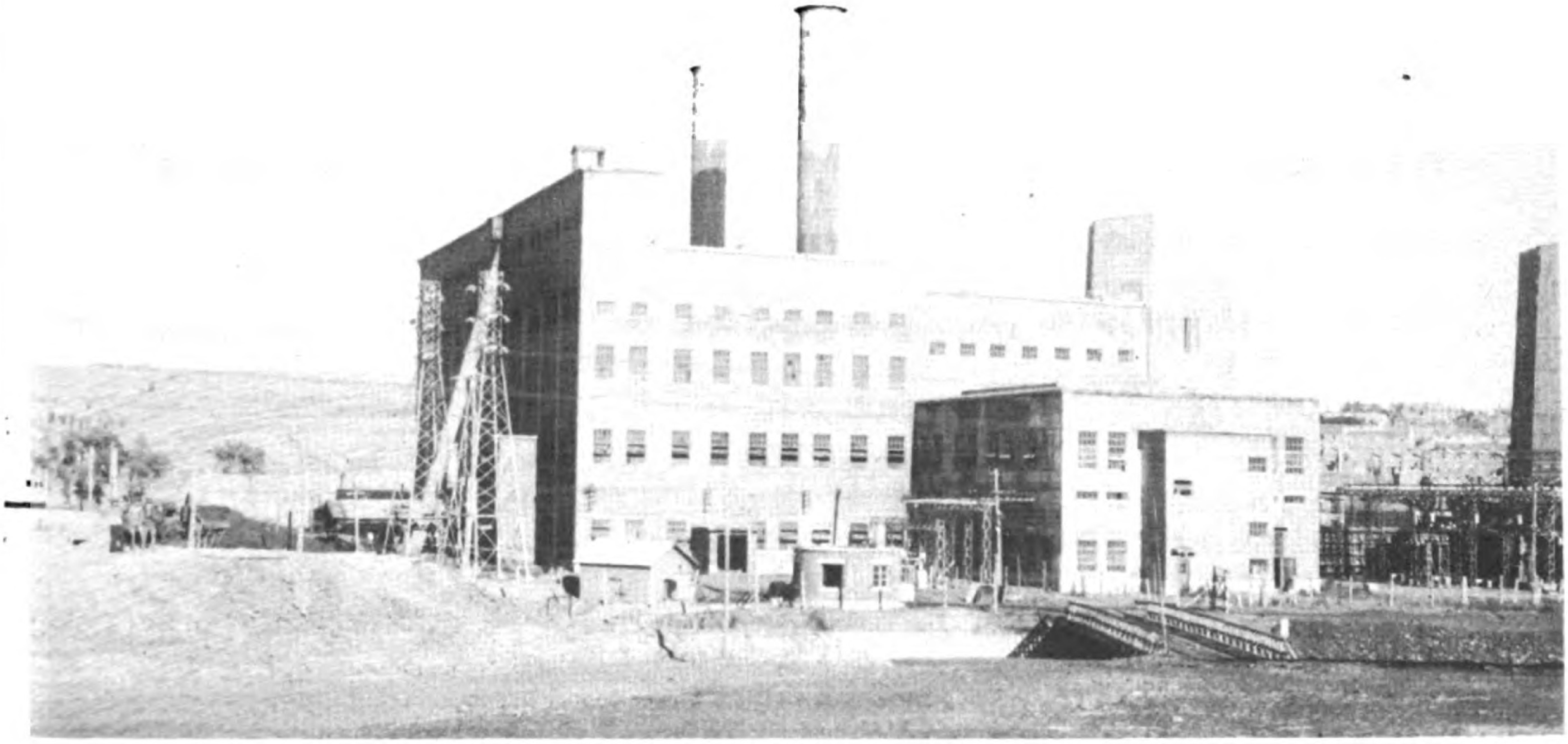
**SOURCE:** Direct observation of Pauley Mission, MEC officials in Changchun, and local officials, July 1946.



Peipiao Power Plant of 15,000 kw, serving the Peipiao Coal Mines in Jehol. No removals were made here but Chinese Communists effected minor damage in May, 1946.



Substation at Peipiao for incoming power. Damaged beyond repair by Chinese Communist explosives in May, 1946.



Hsian Power Plant--30,000 kw--operated in connection with the Hsian Coal Mines. At this plant only plant supplies were removed.

Appendix 3

# INDIVIDUAL ELECTRIC POWER PLANT SUMMARY REPORTS

The following individual plant summary reports list separately all power plants in Manchuria and Jehol giving technical data on equipment, plant performance, removals and comments on present condition. All available sources, including Pauley Mission Plant Inspection Reports, were utilized in an effort to prepare as complete and detailed a listing as possible. Sources have been indicated in order to permit evaluation of the information.

# POWER PLANTS IN KWANGTUNG LEASED TERRITORY

## MEC PLANTS:

Amanogawa
Kanchingtze

## NON MEC PLANTS:

Kwantung Cement Company

## AMANOGAWA (Tienchinchuan)

| | |
|---|---|
| **LOCATION:** | Dairen |
| Province | Kwantung Leased Territory |
| Latitude | 38° 56' |
| Longitude | 121° 39' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1930-1931 |
| **EQUIPMENT:** | |
| Rated capacity | 31,280 kw |
| Normal operating capacity | 10,000 kw |
| Operating capacity 1944-45 | 10,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | TYPE | TYPE |
|---|---|---|---|---|
| 1 | 15,640 | 11 | 3 cyl. double flow | BBC |
| 1 | 15,640 | 11 | 2 cyl. single flow | Mitsubishi |

**BOILERS:**

| No. | Cap.<br>T/hr | Steam Pressure<br>kg/sq.cm. | Temp.<br>°C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 39 | 34 | 425 | CTM | B&W | Pulverized Coal |

**REMOVALS:**
No Information.

| | |
|---|---|
| **CAPACITY REMAINING:** | 31,280 kw |
| **CAPACITY OPERATIVE** | 10,000 kw |
| **SOURCE:** | MEC officials in Changchun, July 1946. |
| **REMARKS:** | It was the intention of MEC to take this plant out of operation. Boiler capacity was low. |

# KANCHINGTZE

**LOCATION:**

| | |
|---|---|
| Province | Dairen |
| Latitude | 38° 55' |
| Longitude | 121° 39' |

| | |
|---|---|
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1934-1941 |

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 83,500 kw |
| Normal operating capacity | 53,000 kw |
| Operating capacity 1944-45 | 53,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | TYPE | Maker |
|---|---|---|---|---|
| 1 | 25,000 | 11 | 3 cyl. double flow | BBC |
| 1 | 25,000 | 11 | 2 " " " | Mitsubishi |
| 1 | 25,000 | 11 | 2 " " " | Seimans |
| 1 | 4,000 | 3.3 | 1 " back pressure | AEG |
| 1 | 4,000 | 3.3 | 1 " " " | SS & Kawasaki |

**BOILERS:**

| No. | Cap. T/hr | Steam Pressure kg/sq.cm. | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 140 | 34 | 440 | Sectional | Mitsubishi | Pulverized Coal |
| 3 | 120 | 34 | 440 | CTM | B & W | " " |

**REMOVALS:**

MEC officials state 50,000 kw, confirmed by Chinese Economic Commission
Two 25,000 kw turbo-generators.
Two 120 T/hr boilers.
Auxiliary equipment for above and all spare parts.

| | |
|---|---|
| **CAPACITY REMAINING:** | Probably 33,000 kw |
| **CAPACITY OPERATIVE:** | Probably 20,000 kw |
| **SOURCE:** | MEC officials in Changchun and Chinese Economic Commission, July 1946 |
| **REMARKS:** | Turbine blades of the BBC machine were broken. Replacement blades were ready but not shipped from BBC. |

# KWANTUNG ONADA CEMENT COMPANY

LOCATION:

| | |
|---|---|
| Province | Kwantung Leased Territory |
| Latitude | 38° 56' |
| Longitude | 121° 39' |

| | |
|---|---|
| OWNER: | Kwantung Onada Cement Company |
| ERECTION DATE: | From 1909 onward |

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 5,200 |
| Turbo-generators | one 3,600 kw<br>one 1,600 kw |

Boilers:
Firing: waste gas

| | |
|---|---|
| REMOVALS: | Probably none |
| CAPACITY REMAINING: | Probably 5,200 kw |
| CAPACITY OPERATIVE: | Estimated 2,900 kw |
| SOURCE: | MEC officials and cement association officials Changchun, July 1946 |
| REMARKS: | See file on cement industry, 301-H-1 |

# POWER PLANTS OF LIAONING PROVINCE

## MEC PLANTS:

### Greater than 1,000 kw:

Erhtaochiang
Fushun Coal Mines
Hsian
Kaiyuan
Suiho
Taoan
Tiehchangtzu
Tienshihfu
Tungliao

### Less than 1,000 kw:

Faku
Kaitung
Taonan

## NON-MEC PLANTS:

Anshan Steel Works, Anshan
Manchu Iron Works, Plants 1, 2 and 3, Penchihu
Antung Cement Co., Antung
Manchu Onada Cement Co., Chuantou
Manchu Asano Cement Co., Chinhsien
Manchu Iwaki Cement Co., Liaoyang
Manchu Iwaki Cement Co., Penchihu
Manchu Iwaki Cement Co., Kunyuan, Penchihu
Army Fuel Depot, Chinhsi
Synthetic Fuels Co., Chinhsien
Mukden Cotton Spinning Co., Mukden
Yingkow Spinning Co., Yingkow
Mukden Arsenal, Mukden

# ERHTAOCHIANG

| | |
|---|---|
| **LOCATION:** | Tunghua |
| Province | Liaoning |
| Latitude | 41° 41' |
| Longitude | 125° 55' |
| | |
| **OWNER:** | MEC |
| | |
| **ERECTION DATE:** | 1941-1944 |
| | |
| **EQUIPMENT:** | |
| Rated capacity | 37,500 kw |
| Normal operating capacity | 30,000 kw |
| Operating capacity 1944-45 | 30,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 15,000 | 5.5 | 1 cyl. single flow | SS & AECT |
| 1 | 7,500 | 11 | 1 Lungstrom | Mitsubishi |

**BOILERS:**

| No. | Cap. T/hr. | Steam Pressure kg/sq.cm. | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 100 | 38 | 440 | Yallow | Hitachi | Pulverized Coal |
| 1 | 55 | 34 | 425 | CTM | B&W | |

| | |
|---|---|
| **REMOVALS:** | Chinese Economic Commission states 37,500 kw -- Not considered reliable.<br>Two 15,000 kw<br>One 7,500 kw |
| **CAPACITY REMAINING:** | Possibly 37,500 |
| **CAPACITY OPERATIVE:** | Possibly 30,000 |
| **SOURCE:** | MEC officials in Changchun and Chinese Economic Commission, July 1946 |
| **REMARKS:** | Some of the turbine blades on the 15,000 kw machines are broken. |

# FUSHUN COAL MINES

| | |
|---|---|
| **LOCATION:** | Fushun |
| Province | Liaoning |
| Latitude | 41° 52' |
| Longitude | 123° 53' |
| **ERECTION DATE:** | 1921-1941 |
| **EQUIPMENT:** | |
| Rated capacity | 285,000 kw |
| Normal operating capacity | 190,000 kw |
| Operating capacity 1944-45 | 90,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 12,500 | 11(60 cycle) | Single cyl. single flow | GE |
| 1 | 12,500 | 11(60 " ) | double " " " | SS&Mitsubishi |
| 2 | 25,000 | 11(60 " ) | single " " " | Mitsubishi |
| 2 | 25,000 | 11(50 " ) | double " double " | " |
| 3 | 50,000 | 11(50 " ) | " " triple " | " |
| 1 | 10,000 | 11(50 " ) | single " single " | " |

**BOILERS:**

| No. | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 20 | 17.6 | 316 | WIF | B&W | Stoker |
| 3 | 66 | 27.5 | 400 | CTM | B&W | " |
| 2 | 60 | 27.5 | 425 | CTM | B&W | " |
| 7 | 120 | 27.5 | 425 | CTM | B&W | Pulverized coal |

**REMOVALS:**
210,000 kw
2 - 25,000 kw turbo-generators
3 - 50,000 " "
1 - 10,000 " "
5 boilers 120 T/m B&W
1 - 12,000 kva transformer
Auxiliary equipment for
turbo-generators and boilers
4 - 20,000 kva transformers
6 sets switchboards & control eqpt.

**CAPACITY REMAINING:** 75,000 kw

**CAPACITY OPERATIVE:** 25,000 kw
(2-25,000 kw units are operating at half capacity producing 25,000 kw. 2 old 12,500 have not yet been put back in operation).

**SOURCE:** Direct observation of Pauley Mission, MEC officials in Changchun, and local officials, July 1946.

# HSIAN

| | |
|---|---|
| **LOCATION:** | Hsian |
| Province | Liaoning |
| Latitude | 42° 55' |
| Longitude | 125° 09' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1938-1939 |
| **EQUIPMENT:** | |
| Rated capacity | 30,000 kw |
| Normal operating capacity | 27,000 kw |
| Operating capacity 1944-45 | 20,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 15,000 | 11 | 1 cyl. single flow | Ishikawashima |

**BOILERS:**

| No. | Cap. T/hr | Steam Pressure | Steam Temp. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 4 | 40 | 25 | 400 | 2- CTM | B&W | Stoker |
| | | | | 2- Sectional | Mitsubishi | " |

| | |
|---|---|
| **REMOVALS:** | No equipment removals, only supplies removed. |
| **CAPACITY REMAINING:** | 30,000 kw |
| **CAPACITY OPERATIVE:** | 3,000 kw. Distributed to Hsian Coal Mines. |
| **SOURCE:** | Direct observation of Pauley Mission, MEC officials in Changchun, and local officials, July 1946. |
| **REMARKS:** | Output could be increased to 27,000 kw by burning 6,000 cal/kg coal instead of the present 4,000 cal/kg coal. See file 28-I-1 for plant inspection report. |

# KAIYUAN

| | |
|---|---|
| **LOCATION:** | **Kaiyuan** |
| Province | **Liaoning** |
| Latitude | 42° 30' |
| Longitude | 124° 00' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1940 |
| **EQUIPMENT:** | |
| Rated capacity | 3,500 kw |
| Normal operating capacity | 3,500 kw |
| Operating capacity 1944-45 | 3,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | TYPE | Maker |
|---|---|---|---|---|
| 1 | 3,500 | 3.3 | 1 cyl. back pressure | AEG |

**BOILERS:**

| No. | Cap. T/hr | Steam Pressure kg/sq.cm. | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 30 | 34.5 | 415 | CTM | B&W | Hand Stoker |

| | |
|---|---|
| **REMOVALS:** | 3,500 kw<br>1 - 3,500 kw turbo-generator<br>2 - 30T/hr boilers<br>Auxiliary equipment and spare parts |
| **CAPACITY REMAINING:** | NONE |
| **CAPACITY OPERATIVE:** | NONE |
| **SOURCE:** | Direct observation of Pauley Mission, MEC officials in Changchun, and local officials, July, 1946. |
| **REMARKS:** | — |

# HSIAN

| | |
|---|---|
| **LOCATION:** | Hsian |
| Province | Liaoning |
| Latitude | 42° 55' |
| Longitude | 125° 09' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1938-1939 |
| **EQUIPMENT:** | |
| Rated capacity | 30,000 kw |
| Normal operating capacity | 27,000 kw |
| Operating capacity 1944-45 | 20,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 15,000 | 11 | 1 cyl. single flow | Ishikavashima |

**BOILERS:**

| No. | Cap. T/hr | Steam Pressure | Steam Temp. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 4 | 40 | 25 | 400 | 2- CTM | B&W | Stoker |
| | | | | 2- Sectional | Mitsubishi | " |

| | |
|---|---|
| **REMOVALS:** | No equipment removals, only supplies removed. |
| **CAPACITY REMAINING:** | 30,000 kw |
| **CAPACITY OPERATIVE:** | 3,000 kw. Distributed to Hsian Coal Mines. |
| **SOURCE:** | Direct observation of Pauley Mission, MEC officials in Changchun, and local officials, July 1946. |
| **REMARKS:** | Output could be increased to 27,000 kw by burning 6,000 cal/kg coal instead of the present 4,000 cal/kg coal. See file 28-I-1 for plant inspection report. |

# KAIYUAN

| | |
|---|---|
| LOCATION: | Kaiyuan |
| Province | Liaoning |
| Latitude | 42° 30' |
| Longitude | 124° 00' |
| OWNER: | MEC |
| ERECTION DATE: | 1940 |
| EQUIPMENT: | |
| Rated capacity | 3,500 kw |
| Normal operating capacity | 3,500 kw |
| Operating capacity 1944-45 | 3,000 kw |

TURBO-GENERATORS:

| Number | KW | KV | TYPE | Maker |
|---|---|---|---|---|
| 1 | 3,500 | 3.3 | 1 cyl. back pressure | AEG |

BOILERS:

| No. | Cap. T/hr | Steam Pressure kg/sq.cm. | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 30 | 34.5 | 415 | CTM | B&W | Hand Stoker |

| | |
|---|---|
| REMOVALS: | 3,500 kw<br>1 - 3,500 kw turbo-generator<br>2 - 30T/hr boilers<br>Auxiliary equipment and spare parts |
| CAPACITY REMAINING: | NONE |
| CAPACITY OPERATIVE: | NONE |
| SOURCE: | Direct observation of Pauley Mission, MEC officials in Changchun, and local officials, July, 1946. |
| REMARKS: | -- |

# SUIHO HYDRO-ELECTRIC PLANT

| | |
|---|---|
| **LOCATION:** | Yalu River, 30 miles above Antung |
| Province | Border between Liaoning province and Korea. |
| Latitude | 40° 27' |
| Longitude | 124° 57' |
| **OWNER:** | Manchuria - Korea Jointly |
| **ERECTION DATE:** | Started 1937 — first power, 1941 |
| **EQUIPMENT:** | |
| Rated capacity | 300,000 (see 'remarks') |
| Normal operating capacity | 300,000 |
| Operating capacity 1944-45 | 180,000 |

**GENERATORS:**

| NUMBER | KW | TYPE | MAKER |
|---|---|---|---|
| 7 | 100,000 | Vertical shaft, revolving field, enclosed, ventilated, 3-phase | Shibaura |

**TURBINES:**

| Number | Capacity | Type | Maker |
|---|---|---|---|
| 7 | 105,000 kw | Vertical shaft, single flow reaction type. | Dengyosya |

**REMOVALS:** Probably 200,000 kw plus a 100,000 kw turbine.
#3 and #4 generators, one 50 cycle and one 50/60 cycle.
#3, #4 and probably #5 turbine (105,000 kw each)
#3 and #4 transformer (100,000 kw each)
2 or 3 sets of switches and auxiliary equipment

**CAPACITY REMAINING:** One 100,000 kw generator without turbine

**CAPACITY OPERATIVE:** None

**SOURCE:** Korean Electric Power Company, Seoul, Korea, confirmed by Chinese Economic Commission.

**REMARKS:** 7 generators of 100,000 kw each were installed of which 6 were operating. 2 units were 50 cycle, 2 were 60 cycle and 3 were 50/60 cycle (one of which is incomplete). It has been reported that #1 unit is operative and #2 has a burned out field coil. #6 and #7 were 60 cycle units for Korea. The 50 cycle generator removed was exclusively for Manchurian supply. The 50/60 cycle generator removed could be used for Manchuria or Korea. In view of the 2 remaining 50/60 cycle units and the statement of General Chistiakov that no capital equipment had been removed from Korea all removed equipment is being considered as Manchurian-owned. The Korean Electric Company reports that during 1944 and 1945 power was delivered to Manchuria at a maximum rate of 180,000 kw while 30,000 kw was the maximum generating capacity delivered to Korea.

# TAOAN (PAICHENGTZU)

| | |
|---|---|
| **LOCATION:** | Taoan |
| Province | Liaoning |
| Latitude | 45° 37' |
| Longitude | 122° 49' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1942-1943 |
| **EQUIPMENT:** | |
| Rated capacity | 3,000 kw |
| Normal operating capacity | 3,000 kw |
| Operating capacity 1944-45 | 3,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 1500 | 3.3 | 1 cyl. single flow (geared) | Ishikawashima & Shibaura |

**BOILERS:**

| No. | Cap. T/hr | Steam Pressure kg/sq.cm. | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 12 | 15 | 350 | Yallow | Hitachi | Stoker |

**REMOVALS:**

Probably 1 - 1,500 kw turbo-generator
MEC officials in Changchun state 1,500 kw turbo-generator
1- 12T/m boiler
Operating equipment and spare parts

**CAPACITY REMAINING:** Probably 1,500 kw

**CAPACITY OPERATIVE:** Probably 1,500 kw

**SOURCE:** MEC officials in Changchun, July 1946.

**REMARKS:** All new equipment

# TIEHCHANGTZU

| | |
|---|---|
| LOCATION: | Tiehchangtsu |
| Province | Liaoning |
| Latitude | 41° 38' |
| Longitude | 126° 12' |

OWNER: MEC

ERECTION DATE: 1939

EQUIPMENT:

| | |
|---|---|
| Rated capacity | 1,000 kw |
| Normal operating capacity | 800 kw |
| Operating capacity 1944-45 | 800 kw |

TURBO-GENERATORS:

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 1,000 | 3.3 | 1 cyl. single flow | EW & SS |

BOILERS:

| No. | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 4.3 | 13.5 | 300 | WIF | B&W | Stoker |

REMOVALS: No information

CAPACITY REMAINING: Probably 1,000 kw

CAPACITY OPERATIVE: Probably 800 kw

SOURCE: MEC officials in Changchun, July 1946

REMARKS: The exciter capacity is insufficient. This is a 60 cycle machine used at 50 cycles.

# TIENSHIHFU

**LOCATION:** Tienshihfu
Province Liaoning
Latitude 41° 16'
Longitude 124° 21'

**OWNER:** MEC

**ERECTION DATE:** 1940

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 3,000 kw |
| Normal operating capacity | 3,000 kw |
| Operating capacity 1944-45 | 3,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 1,500 | 3.3 | 1 cyl. single flow | EW and Mitsubishi |

**BOILERS:**

| No. | Cap. T/hr | Steam Pressure kg/sq.cm. | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 10 | 15 | 340 | CTM | B&W | Pulverized Coal |

**REMOVALS:** No information

**CAPACITY REMAINING:** Probably 3,000 kw

**CAPACITY OPERATIVE:** Probably 3,000 kw

**SOURCE:** MEC officials in Changchun, July 1946

**REMARKS:** ——

# TUNGLIAO

| | |
|---|---|
| **LOCATION:** | Tungliao |
| Province | Liaoning |
| Latitude | 43° 43' |
| Longitude | 122° 10' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1938-1943 |

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 2,100 kw |
| Normal operating capacity | 1,200 kw |
| Operating capacity 1944-45 | 1,200 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 200 | 2.3 | 1 cyl. single flow | Gen. Electric |
| 1 | 500 | 2.3 | 1 " " " | " " |
| 1 | 1,400 | 3.3 | Lungstrom | STAL & ASEA |

**BOILERS:**

| No. | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 3.8 | 10.5 | 245 | Heine | Heine | Hand Stoker |
| 1 | 3.16 | 10.5 | 245 | WIF | B&W | " " |
| 1 | 5.0 | 15. | 350 | " | " | " " |
| 1 | 7.5 | 15. | 350 | " | " | " " |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 2,100 kw |
| **CAPACITY OPERATIVE:** | Probably 1,200 kw |
| **SOURCE:** | MEC officials in Changchun, July 1946 |
| **REMARKS:** | Steam pressure and terminal voltage are different; hence all machines cannot be paralleled. |

# FAKU

**LOCATION:** Faku
Province Liaoning
Latitude 42° 30'
Longitude 123° 30'

**OWNER:** MEC

**ERECTION DATE:** 1928

**EQUIPMENT:**
Rated capacity 350 kw
Normal operating capacity 300 kw
Operating capacity 1944-45 300 kw

**GENERATORS:**

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 438 | 2.3 | — | MV |

**RECIP. STEAM ENGINE:**

| No. | Cap. HP | Steam Pressure kg/sq.cm | Steam Temp. oC | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 438 | 10.5 | 266 | — | BE | — |

**REMOVALS:** No information

**CAPACITY REMAINING:** Probably 350 kw

**CAPACITY OPERATIVE:** Probably 300 kw

**SOURCE:** MEC officials in Changchun, July 1946

**REMARKS:** Machinery is old

# KAITUNG

| | |
|---|---|
| LOCATION: | Kaitung |
| Province | Liaoning |
| Latitude | 44° 50' |
| Longitude | 123° 05' |
| OWNER: | MEC |
| ERECTION DATE: | 1939 |

EQUIPMENT:

Rated capacity 100 kw

GENERATORS:

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 112 | 3.3 | — | Yasukawa |

DIESEL ENGINE:

| No. | Cap. HP | Stroke mm | No. of Cyl. | Maker |
|---|---|---|---|---|
| 1 | 150 | 400 | 2 | Zulze |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 100 kw. |
| CAPACITY OPERATIVE: | Est. 55 kw |
| SOURCE: | MEC officials in Changchun, July 1946 |
| REMARKS: | MEC Transmission Charts from Tokyo indicated:<br>1 - 100 kw generator<br>1 - 80 kw " |

# TAONAN

| | |
|---|---|
| LOCATION: | Taonan |
| Province | Liaoning |
| Latitude | 45° 30' |
| Longitude | 122° 45' |
| OWNER: | MEC |
| ERECTION DATE: | --- |
| EQUIPMENT: | |
| Rated capacity | 925 kw |

TURBO-GENERATORS:

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 500 | 3.3 | -- | -- |
| 1 | 425 | 3.3 | -- | -- |

BOILERS:

| No. | Cap. T/hr | Steam Pressure kg/sq.cm. | Steam Temp. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

REMOVALS: No information

CAPACITY REMAINING: Probably 925 kw

CAPACITY OPERATIVE: Est. 600 kw

SOURCE: Data listed only on MEC Transmission charts from Tokyo.

REMARKS: ---

# ANSHAN STEEL WORKS

| | |
|---|---|
| LOCATION: | Anshan |
| Province | Liaoning |
| Latitude | 41° 05' |
| Longitude | 122° 55' |
| OWNER: | Anshan Steel Works |
| ERECTION DATE: | --- |
| EQUIPMENT: | |
| Rated capacity | 73,500 kw |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 25,000 | - | - | - |
| 1 | 12,500 | | | |
| 2 | 18,000 | | | |

BOILERS:

| Number | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 6 | 45-60 | | | 3 drum | - | 2 coal fired |
| 4 | 40-55 | | | superheater | | 4 coal & gas fire |
| | | | | water tube | | 4 gas fired |

REMOVALS:

43,000 kw
1 - 25,000 kw turbo-generator and auxiliary equipment
1 - 18,000 kw turbo-generator
2 - 40-55 T/hr boilers
4 - 45-60 T/hr boilers

| | |
|---|---|
| CAPACITY REMAINING: | 30,500 kw |
| CAPACITY OPERATIVE: | None |
| SOURCE: | Direct observation of Pauley Mission, MEC officials in Changchun and local officials, July 1946 |
| REMARKS: | See File 2-L-1 for plant inspection report. Chinese Communist forces burned and transformer house including 2 - 3000 kva transformers and all circuit breakers and control equipment. Two boilers remain operative capable of rendering steam for a continuous load of 7,000 kw. |

# MANCHU IRON WORKS POWER STATION NO. 1 ( of 3)

| | |
|---|---|
| LOCATION: | Penchihu |
| Province | Liaoning |
| Latitude | 41° 20' |
| Longitude | 123° 45' |
| OWNER: | Manchu Iron Works |
| ERECTION DATE: | 1915-17 |
| EQUIPMENT: | |
| Rated capacity: | 13,000 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 1,500 | | | |
| 1 | 2,500 | | | |
| 1 | 3,000 | | | |
| 1 | 6,000 | | | |

| | |
|---|---|
| REMOVALS: | 6,000 kw<br>1 - 6,000 kw turbo-generator with auxiliary equipment |
| CAPACITY REMAINING: | 7,000 kw |
| CAPACITY OPERATIVE: | 4,000 kw |
| SOURCE: | Direct observation of Pauley Mission, MEC officials in Changchun and local officials, July 1946. |
| REMARKS: | All equipment except the 6,000 kw generator is badly worn.<br>1,500 kw generator operating<br>2,500 kw generator expected to operate<br>3,000 kw generator extensive repairs<br>See File No. 2-L-2 for plant inspection report. |

# MANCHU IRON WORKS POWER STATION NO. 2 (of 3)

| | |
|---|---|
| LOCATION: | Penchihu |
| Province | Liaoning |
| Latitude | 41° 20' |
| Longitude | 123° 45' |
| OWNER: | Manchu Iron Works |
| ERECTION DATE: | 1939 |
| EQUIPMENT: | |
| Rated capacity: | 28,000 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 2 | 14,000 | | | |

BOILERS:

| Number | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 3 | 80 | 27 | 385 | | | Pulverized coal |

| | |
|---|---|
| REMOVALS: | None observed |
| CAPACITY REMAINING: | 28,000 kw |
| CAPACITY OPERATIVE: | None |
| SOURCE: | Direct observation of Pauley Mission and MEC officials in Changchun and local officials July 1946. |
| REMARKS: | See File No. 2-L-3 for plant inspection report. Chinese Communists planted explosives in one boiler destroying it and the building. Extent of damage was not determined (June 1946). Presumably turbo-generators remain intact under debris. |

## MANCHU IRON WORKS POWER STATION NO. 3 (of 3)

| | |
|---|---|
| LOCATION: | Kungyuan, (Penchihu) |
| Province | Liaoing |
| Latitude | 41° 20' |
| Longitude | 123° 45' |
| OWNER: | Manchu Iron Works |
| ERECTION DATE: | 1938 |
| EQUIPMENT: | |
| Rated capacity | 40,000 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 2 | 20,000 | - | - | - |

| Number | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 5 | 90-120 | 25 | 400 | | | |

| | |
|---|---|
| REMOVALS: | 40,000 kw<br>2 - 20,000 kw<br>Spare 20,000 kw turbine<br>All auxiliary equipment for turbo generators<br>2 - 9,000 kva transformers<br>2 - 6,000 kva transformers<br>5 boilers and auxiliary equipment |
| CAPACITY REMAINING: | None |
| CAPACITY OPERATIVE: | None |
| SOURCE: | Direct observation of Pauley Mission, MEC officials in Changchun, and local officials, July 1946. |
| REMARKS: | See File No. 2-L-3 for plant inspection report. |

# ANTUNG CEMENT COMPANY

| | |
|---|---|
| **LOCATION:** | Antung |
| Province | Liaoning |
| Latitude | 40° 08' |
| Longitude | 124° 24' |
| **OWNER:** | Antung Cement Co. |
| **ERECTION DATE:** | 1941 |
| **EQUIPMENT:** | |
| Rated capacity | 5,800 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

**TURBO-GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 3,850 | | | |
| 1 | 2,000 | | | |

**BOILERS:**

| Number | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| | | | | | | Waste gas |

| | |
|---|---|
| **REMOVALS:** | 5,800 kw according to officials of Manchurian Cement Association<br>1 - 3,850 kw<br>1 - 2,000 kw<br>Auxiliary equipment |
| **CAPACITY REMAINING:** | Probably none |
| **CAPACITY OPERATIVE:** | Probably none |
| **SOURCE:** | MEC officials and Cement Association officials in Changchun, July 1946 |
| **REMARKS:** | See File No. 303-H-1 supplementary report |

# MANCHU ONADA CEMENT COMPANY

| | |
|---|---|
| LOCATION: | Chuantou |
| Province | Liaoning |
| Latitude | 42° 53' |
| Longitude | 124° 10' |
| OWNER: | Manchu Onada Cement Company |
| ERECTION DATE: | 1936 |
| EQUIPMENT: | |
| Rated capacity | 3,500 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 3,500 | | | |

BOILERS:

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| | | | | | | Waste gas |

| | |
|---|---|
| REMOVALS: | 3,500 kw<br>1 - 3,500 kw<br>Auxiliary equipment |
| CAPACITY REMAINING: | None |
| CAPACITY OPERATIVE: | None |
| SOURCE: | Direct observation of Pauley Mission, MEC officials, and Cement Association officials, July 1946. |
| REMARKS: | File No. 303-H-1 and 29-H-1 for plant inspection report and supplementary data. |

# MANCHU ASANO CEMENT COMPANY

| | |
|---|---|
| **LOCATION:** | Chinhsien (Chinchow) |
| Province | Liaoning |
| Latitude | 41° 07' |
| Longitude | 121° 06' |
| **OWNER:** | Manchu Asano Cement Company |
| **ERECTION DATE:** | 1942 |
| **EQUIPMENT:** | |
| Rated capacity | 6,000 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

**TURBO-GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 6,000 | | | |

**BOILERS:**

| Number | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | | | | | | Waste gas |

| | |
|---|---|
| **REMOVALS:** | None |
| **CAPACITY REMAINING:** | 6,000 kw |
| **CAPACITY OPERATIVE:** | 1,500 kw |
| **SOURCE:** | Direct observation of Pauley Mission, MEC officials, and Cement Association officials in Changchun, July 1946. |
| **REMARKS:** | See File No. 301-H-1 and 6-H-1 for plant inspection report and supplementary data. |

# MANCHU IWAKI CEMENT CO.

(Liaoyang)

| | |
|---|---|
| LOCATION: | Liaoyang |
| Province | Liaoning |
| Latitude | 41° 17' |
| Longitude | 123° 11' |
| OWNER: | Manchu Iwaki Cement Company |
| ERECTION DATE: | 1935 |
| EQUIPMENT: | |
| Reted capacity | 4,400 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

TURBO-GENERATORS:

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 2,200 | 3.3 | | |

| | |
|---|---|
| REMOVALS: | NONE |
| CAPACITY REMAINING: | 4,400 kw |
| CAPACITY OPERATIVE: | Estimated 3,000 kw |
| SOURCE: | Direct observation of Pauley Mission, MEC officials, and Cement Association officials, July, 1946 |
| REMARKS: | See File No. 301-H-1 and 2-H-3 for plant inspection report and supplementary data. |

# MANCHU IWAKI CEMENT CO.

(Penchihu)

| | |
|---|---|
| LOCATION: | Penchihu |
| Province | Liaoning |
| Latitude | 41° 21' |
| Longitude | 123° 45' |
| OWNER: | Manchu Iwaki Cement Company |
| ERECTION DATE: | 1936 |
| EQUIPMENT: | |
| Rated capacity | 8,000 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

TURBO-GENERATORS:

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 4,000 | | | |

| | |
|---|---|
| REMOVALS: | 8,000 kw<br>2 - 4,000 kw<br>Auxiliary equipment |
| CAPACITY REMAINING: | NONE |
| CAPACITY OPERATIVE: | NONE |
| SOURCE: | Direct observation of Pauley Mission, MEC officials, and Cement Association officials Changchun, July, 1946 |
| REMARKS: | See File No. 301-14-1 and 2-H-2 for plant inspection report and supplementary data. |

# MANCHU IWAKI CEMENT CO.
(Kungyuan)

| | |
|---|---|
| **LOCATION:** | Kungyuan, Penchihu |
| Province | Liaoning |
| Latitude | 41° 21' |
| Longitude | 123° 25' |
| **OWNER:** | Manchu Iwaki Cement Co. |
| **ERECTION DATE:** | 1942 |
| **EQUIPMENT:** | |
| Rated capacity | 6,000 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

**TURBO-GENERATORS:**

| Number | KW |
|---|---|
| 1 | 6,000 |

**BOILERS:**

| Firing |
|---|
| Waste gas |

| | |
|---|---|
| **REMOVALS:** | 6,000 kw<br>1- 6,000 kw turbo-generator<br>Auxiliary equipment |
| **CAPACITY REMAINING:** | NONE |
| **CAPACITY OPERATIVE:** | NONE |
| **SOURCE:** | Direct observation of Pauley Mission, MEC officials, and Cement Association officials in Changchun, July, 1946. |
| **REMARKS:** | See file No. 301-H and 2-H-2 for plant inspection report and supplementary data. |

# ARMY FUEL DEPOT
## CHINSHI

| | |
|---|---|
| LOCATION: | Chinhsi |
| Province | Liaoning |
| Latitude | 40° 54' |
| Longitude | 120° 36' |
| OWNER: | Formerly under Japanese Kwantung Army |
| ERECTION DATE: | 1943 |
| EQUIPMENT: | |
| Rated capacity | 15,000 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

TURBO-GENERATORS:

| Number | KW |
|---|---|
| 1 | 13,500 |

BOILERS:

| Number |
|---|
| 2 |

| | |
|---|---|
| REMOVALS: | NONE |
| CAPACITY REMAINING: | 15,000 kw |
| CAPACITY OPERATIVE: | NONE |
| SOURCE: | Direct observation of Pauley Mission, MEC officials in Changchun and local officials. |
| REMARKS: | See File No. 6-I-1 for plant inspection report |

## SYNTHETIC FEULS COMPANY LTD.

| | |
|---|---|
| LOCATION: | Chinhsien (Chinchow) |
| Province | Liaoning |
| Latitude | 41° 07' |
| Longitude | 121° 06' |
| OWNER: | Synthetic Fuels Co., Ltd. |
| ERECTION DATE: | 1943 |
| EQUIPMENT: | |
| Rated capacity | 5,000 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

TURBO-GENERATORS:

| Number | KW |
|---|---|
| 2 | 2,500 kw |

BOILERS:

| Number | Type | Firing |
|---|---|---|
| 3 | Back pressure | waste heat |

| | |
|---|---|
| REMOVALS: | NONE |
| CAPACITY REMAINING: | 5,000 kw |
| CAPACITY OPERATIVE: | 2,500 kw |
| SOURCE: | Direct observation of Pauley Mission, MEC officials in Changchun, and local officials, July, 1946 |
| REMARKS: | See File No. 23-E-1 for plant inspection report. |

# MUKDEN COTTON SPINNING CO.

| | |
|---|---|
| LOCATION: | Mukden |
| Province | Liaoning |
| Latitude | 41° 48' |
| Longitude | 123° 27' |
| OWNER: | Mukden Cotton Spinning Co. |
| ERECTION DATE: | |
| EQUIPMENT: | |
| Rated capacity | 1,250 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |
| REMOVALS: | NONE |
| CAPACITY REMAINING: | 1,250 kw |
| CAPACITY OPERATIVE: | 1,000 kw |
| SOURCE: | Direct observation of Pauley Mission, MEC officials in Changchun and local officials, July, 1946 |
| REMARKS: | ---- |

## YINGKOW SPINNING COMPANY

| | |
|---|---|
| **LOCATION:** | Yingkow |
| Province | Liaoning |
| Latitude | 40° 40' |
| Longitude | 122° 17' |
| **OWNER:** | A textile company in Yingkou |
| **ERECTION DATE:** | |
| **EQUIPMENT:** | |
| Rated capacity | 1,000 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |
| **REMOVALS:** | Probably none |
| **CAPACITY REMAINING:** | Probably 1,000 kw. |
| **CAPACITY OPERATIVE:** | Probably 600 kw. |
| **SOURCE:** | MEC officials in Changchun, July, 1946 |
| **REMARKS:** | The name of the company not definitely ascertained. |

# MUKDEN ARSENAL

| | |
|---|---|
| **LOCATION:** | Mukden |
| Province | Liaoning |
| Latitude | 41° 48' |
| Longitude | 123° 27' |
| **OWNER:** | Formerly under Japanese Kwantung Army |
| **ERECTION DATE:** | |
| **EQUIPMENT:** | |
| Rated capacity | 10,000 kw |
| Normal operating capacity | 7,000 |
| Operating capacity 1944-45 | 3,000 |
| **REMOVALS:** | NONE |
| **CAPACITY REMAINING:** | 10,000 kw |
| **CAPACITY OPERATIVE:** | 3,000 kw |
| **SOURCE:** | Direct observation of the Pauley Mission, MEC officials in Changchun and local officials, June, 1946. |
| **REMARKS:** | This plant is presently operating at a capacity of 3,000 kw supplying power for electric lighting in Mukden. |

# POWER PLANTS OF KIRIN PROVINCE

## MEC PLANTS:

### Greater than 1,000 kw:

Changchun
Chiamussu
Chiaoho
Chienchen
Chingpohu
Chining
Harbin
Hunchun
Lungching
Mutanchiang
Suifenho
Tafengmen
Titao
Tuhsi

### Less than 1,000 kw:

Chienkouchi
Fuchin
Ilan
Imienpo
Nungan
Sanchaho
Sunghuachiang
Tehui
Wangching
Wuchang
Yushu

## NON MEC PLANTS:

Manchu Asano Cement Co., Kirin
Toman Cement Co., Miaoling
Manchuria Synthetic Petroleum Co., Kirin
Oriental Pulp Co., Shihhsien
Manchu Pulp Co., Hailin
Toyo Pulp Co., Jihman
Nickiman Pulp Co., Jihman
Toman Pulp Co., Kaishantung

# CHANGCHUN

| | |
|---|---|
| **LOCATION:** | Changchun |
| Province | Kirin |
| Latitude | 43° 52' |
| Longitude | 125° 21' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1934-1942 |
| **EQUIPMENT:** | |
| Rated capacity | 49,250 kw |
| Normal operating capacity | 42,000 kw |
| Operating capacity 1944-45 | 30,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 7,000 | 11 | Lungstrom | STAL |
| 1 | 7,000 | 3.3 | " | Mitsubishi |
| 1 | 14,000 | 11 | " | " |
| 1 | 6,250 | 11 | 1 cyl. single flow | WH & Kawashima |
| 1 | 15,000 | 11 | " | Hitachi |

**BOILERS:**

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 3 | 38.5 | 24 | 400 | Vertical | Mitsubishi | Pulv. Coal |
| 3 | 40 | 24 | 400 | " | " | " |
| 1 | 40 | 24 | 400 | Sectional | " | Stoker |

| | |
|---|---|
| **REMOVALS:** | NONE |
| **CAPACITY REMAINING:** | 49,250 kw |
| **CAPACITY OPERATIVE:** | NONE |
| **SOURCE:** | Direct observation of Pauley Mission, MEC officials in Changchun and local officials, July, 1946. |
| **REMARKS:** | Two sets of air heaters of the pulverized coal fired boilers need repair. Their repair will increase output from 30,000 kw to 42,000 kw. |

# CHIAMUSSU

| | |
|---|---|
| LOCATION: | Chiamussu |
| Province | Kirin |
| Latitude | 46° 50' |
| Longitude | 130° 20' |
| OWNER: | MEC |
| ERECTION DATE: | 1941-1943 |
| EQUIPMENT: | |
| Rated capacity | 22,500 kw |
| Normal operating capacity | 20,000 kw |
| Operating capacity 1944-45 | 20,000 kw |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 3 | 7,500 | 11 | Lungstrom | Mitsubishi |

BOILERS:

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 4 | 40 | 25 | 400 | Sectional | Mitsubishi | Stoker |

REMOVALS: 22,500 kw possibly removed according to MEC officials in Changchun

3- 7,500 kw

2- 40 T/hr boilers

| | |
|---|---|
| CAPACITY REMAINING: | Possibly 22,500 kw |
| CAPACITY OPERATIVE: | Unknown |
| SOURCE: | MEC officials in Changchun, July, 1946 |
| REMARKS: | - - - |

# CHIAOHO

| | |
|---|---|
| **LOCATION:** | Chiaoho |
| Province | Kirin |
| Latitude | 43° 45' |
| Longitude | 127° 20' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1937-1944 |
| **EQUIPMENT:** | |
| Rated capacity | 10,880 kw |
| Normal operating capacity | 10,000 kw |
| Operating capacity 1944-45 | 9,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 1,000 | 3.3 | Lungstrom | Mitsubishi |
| 1 | 880 | " | " | " |
| 3 | 3,000 | " | 1 cyl. single flow | EW and Mitsubishi |

**BOILERS:**

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 13 | 14 | 286 | WIF | B&W | Stoker |
| 1 | 13.5 | 14 | 350 | Takuma | Kishakiasha | " |
| 3 | 20 | 15 | 350 | CTM | B&W | " |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 10,880 kw |
| **CAPACITY OPERATIVE:** | Probably 9,000 kw |
| **SOURCE:** | MEC officials in Changchun 1946. |
| **REMARKS:** | Output could be increased from present level to 10,000 by using 5,500 cal/kg coal |

# CHIENCHEN

| | |
|---|---|
| **LOCATION:** | Chienchen |
| Province | Kirin |
| Latitude | 46° 20' |
| Longitude | 130° 30' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1938-1941 |
| **EQUIPMENT:** | |
| Rated capacity | 3,000 kw |
| Normal operating capacity | 3,000 kw |
| Operating capacity 1944-45 | 3,000 kw |

**TURBO-GENERATORS :**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 2 | 1,500 | 3.3 | 1 cyl. single flow | Ishihazima and Shibaura |

**BOILERS:**

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 3 | 10 | 15 | 350 | CT<br>CTM | Toyo B&W | Pulverized coal<br>stoker |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 3,000 kw |
| **CAPACITY OPERATIVE:** | Probably 3,000 kw |
| **SOURCE:** | MEC officials in Changchun, July, 1946 |
| **REMARKS:** | One 1,500 kw unit uses a reduction gear |

# CHINGPOHU HYDRO-ELECTRIC PLANT

| | |
|---|---|
| LOCATION: | Chingpohu |
| Province | Kirin |
| Latitude | 44° 02' |
| Longitude | 129° 50' |
| OWNER: | MEC |
| ERECTION DATE: | |
| EQUIPMENT: | |
| Rated capacity | 36,000 kw |
| Normal operating capacity | 36,000 kw |
| Operating capacity 1944-45 | 36,000 kw |

GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 2 | 18,000kw | 11 | Vertical revolving field, synchronous | Mitsubishi |

TURBINES:

| Number | Capacity | Head | Type | Maker | Firing |
|---|---|---|---|---|---|
| 2 | 18,000 kw | 53 Meters | Vertical Francis | Mitsubishi | |

| | |
|---|---|
| REMOVALS: | Chinese Communists state no removals were made. |
| CAPACITY REMAINING: | Probably 36,000 kw |
| CAPACITY OPERATIVE: | Probably 36,000 kw |
| SOURCE: | MEC officials in Changchun and Chinese Communist military forces in Mutanchiang. |
| REMARKS: | Chinese Communists state that this plant will be in operation in the summer of 1946. The former Japanese operators state the plant was left intact except for slight damage due to flooding. |

# CHINING

| | |
|---|---|
| **LOCATION:** | Chining |
| Province | Kirin |
| Latitude | 45° 20' |
| Longitude | 131° 05' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1941-1942 |
| **EQUIPMENT:** | |
| Rated capacity | 30,000 kw |
| Normal operating capacity | 27,000 kw |
| Operating capacity 1944-45 | 27,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 2 | 15,000 | 11 (?) | 1 cyl. single flow | Ishihawazima & Shubaura |

**BOILERS:**

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 80 | 24 | 400 | Three drum vertical | Mitsubishi | Stoker |

**REMOVALS:** 15,000 kw possibly removed according to MEC officials
1 - 15,000 kw turbo-generator
2 - 80 T/hr boilers

| | |
|---|---|
| **CAPACITY REMAINING:** | Possibly 30,000 kw |
| **CAPACITY OPERATIVE:** | Unknown |
| **SOURCE:** | MEC officials in Changchun, July, 1946 |
| **REMARKS:** | Temperature rise of machinery is rather high in summer |

# HARBIN (PINCHIANG)

LOCATION: Harbin (Pinchiang)
Province Kirin
Latitude 45° 45'
Longitude 126° 39'

OWNER: MEC

ERECTION DATE: 1927-1942

EQUIPMENT:
Rated capacity: 38,000 kw
Normal operating capacity: 30,000 kw
Operating capacity 1944-45: 20,000 kw

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 2 | 2,000 | 6.6 | 1 cyl. single flow | Sienans |
| 1 | 6,000 | 6.6 | 1 cyl. single flow | AEG |
| 2 | 14,000 | 6.6 | Lungstrom | Mitsubishi |

BOILERS:

| Number | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 39 | 24 | 400 | Sectional | Mitsubishi | Stoker |
| 3 | 40 | 24 | 400 | Sectional | Mitsubishi | Stoker |

REMOVALS: None

CAPACITY REMAINING: 38,000 kw

CAPACITY OPERATIVE: None

SOURCE: Direct observation of Pauley Mission, MEC officials in Changchun and local officials, July 1946.

REMARKS: Plant not operating for lack of coal, and because of adequate power from Tafengmen hydro power plant. By increasing calorific value of coal from 4500 cal/kg to 6500 cal/kg output could be increased to 30,000 kw.

# HUNCHUN

LOCATION: Hunchun
Province: Kirin
Latitude: 42° 50'
Longitude: 130° 25'

OWNER: MEC

ERECTION DATE: 1941

EQUIPMENT:
Rated capacity: 5,600 kw
Normal operating capacity: 3,000 kw
Operating capacity 1944-45: 2,000 kw

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 2 | 2,800 | 3.3 | 1 cyl. single flow | F. W. and Sienens |

BOILERS:

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 5 | 15 | 14 | 335 | W.I.F. | B & W | Stoker |

REMOVALS: No information

CAPACITY REMAINING: Probably 5,600 kw

CAPACITY OPERATIVE: Probably 2,000 kw

SOURCE: MEC officials in Changchun July, 1946

REMARKS: 3,000 kw can be obtained by using 6,000 cal/kg coal. Due to the difficulty of burning the high ash Hun-ch'un coal, two of the five boilers were rebuilt for that coal in 1945.

# LUNGCHING

| | |
|---|---|
| LOCATION: | Lungchingtsun |
| Province | Kirin |
| Latitude | 42° 50' |
| Longitude | 129o 30' |
| OWNER: | MEC |
| ERECTION DATE: | 1940-1941 |

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 11,000 kw |
| Normal operating capacity: | 9,000 kw |
| Operating capacity: | 9,000 kw |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 7,000 | 3.5 | 1 cyl. single flow | Kawasaki-Fugi |
| 1 | 4,000 | 3.5 | 1 cyl. single flow | G. E. |

BOILERS:

| Number | Cap. T/hr. | Steam Pressure kg/sq.cm. | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 39.15 | 35 | 420 | W.I.F. | B & W | |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 11,000 kw. |
| CAPACITY OPERATIVE: | Probably 9,000 kw. |
| SOURCE: | MEC officials in Changchun July 1946. |
| REMARKS: | Turbine blades of the 4,000 kw machine are damaged. |

# MUTANCHIANG

| | |
|---|---|
| LOCATION: | Mutanchiang |
| Province | Kirin |
| Latitude | 44° 30' |
| Longitude | 129° 30' |
| OWNER: | MEC |
| ERECTION DATE: | 1936-40 |

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 9,700 kw |
| Normal operating capacity: | 8,000 kw |
| Operating capacity 1944-45: | 5,300 kw |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 1,000 | | | G.E. |
| 1 | 2,320 | | | I.G.F. |
| 1 | 2,625 | | | Mitsubishi |
| 1 | 3,750 | | | Mitsubishi |

BOILERS:

| Number | Cap. T/hr | Steam Pressure kg/sq.cm. | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 6 | 3-5 | | | | | |

| | |
|---|---|
| REMOVALS: | None |
| CAPACITY REMAINING: | 9,700 kw |
| CAPACITY OPERATIVE: | 3,750 kw |
| SOURCE: | Direct observation by Pauley Mission, MEC officials in Changchun and local Chinese Communist officials, July 1946. |
| REMARKS: | Capacity could be raised to 8,000 kw by using 6,500 cal/kg coal instead of 4,500 cal/kg coal. #3, 4 and 5 boilers non operative due to lack of maintenance. #3 generator burned out. Plant used primarily for standby. See File No. 13-L-1 for plant inspection report. |

## [illegible]

LOCATION: [illegible]
Province Kirin
Latitude 4[illegible]° 20'
Longitude 12[illegible]° 10'

OWNER: MEC

ERECTION DATE: 1937-40

EQUIPMENT:

Rated capacity: 1,600 kw
Normal operating capacity: 1,200 kw
Operating capacity 1944-45: 1,200 kw

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 1,000 | 3.3 | 1 cyl. single flow | G.E. |
| 1 | 600 | 3.3 | 1 cyl. single flow | G.E. |

BOILERS:

| Number | Cap. T/hr. | Steam Pressure kg sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 6 | 11.2 | 280 | Stirling | Seine | Stoker |
| 2 | 7 | 15 | 350 | WIF | B & W | Stoker |

REMOVALS: No information

CAPACITY REMAINING: Probably 1,600 kw

CAPACITY OPERATIVE: Probably 1,200 kw

SOURCE: MEC officials in Changchun, July 1946

REMARKS: The 1,000 kw machine is a 60 cycle machine operating at 50 cycles.

# TAFENGMEN HYDROELECTRIC PLANT

| | |
|---|---|
| **LOCATION:** | Near Kirin city |
| Province | Kirin |
| Latitude | 43° 45' |
| Longitude | 126° 45' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | Started 1937, first power 1943 |

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity: | 283,000 kw (see "Remarks") |
| Normal operating capacity: | 283,000 kw |
| Operating capacity 1944-45: | 283,000 kw |

**GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 2 | 70,000 | 13.8 | Vertical | WH |
| 1 | 70,000 | 13.8 | revolving | AEG |
| 2 | 70,000 | 13.8 | field | Hitachi |
| 2 | 1,500 | 3.3 | synchronous | WH |

**TURBINES:**

| Number | Cap. kw | Head in Meters | Type | Maker |
|---|---|---|---|---|
| 2 | 85,000 | 69 | Vertical, | EW |
| 1 | 85,000 | 69 | Francis | Voit |
| 2 | 85,000 | 69 | " | Hitachi (1 unfinished) |
| 2 | 1,600 | 69 | " | EW |

**REMOVALS:**

420,000 kw
2 - 70,000 kva turbo-generators in operation
1 - 70,000 " " installed but not operating
1 - 70,000 kva turbo-generator uninstalled awaiting aux. equipment.
2 - 70,000 kva turbo-generators awaiting turbines
All auxiliary equipment for above and all spare parts
2 - 70,000 kva 13.2 kv 220-230 kva transformers
3 - 70,000 kva 13.2 kv 154-161 kva transformers.
Miscellaneous electrical, mechanical & construction equipment.

CAPACITY REMAINING: 140,000 kw

CAPACITY OPERATIVE: 70,000 kw operative. An additional 70,000 kw will be available if transmission lines are repaired.

SOURCE: Direct observation of Pauley Mission, MEC officials in Changchun and local officials, July 1946.

REMARKS: 283,000 kw of a planned 563,000 kw were in operation August 1945. The remaining equipment was close to completion. The dam was not quite complete and must be strengthened by Fall 1946 to prevent flooding and damage. Distribution to the north supplied Kirin, Changchun and Harbin. Power lines for distribution to the South are in Chinese Communist hands and have been cut. Restoration of this line would greatly aid the power deficient South, particularly the coal mines.

# TITAO

| | |
|---|---|
| LOCATION: | Titao |
| Province | Kirin |
| Latitude | 45° 30' |
| Longitude | 130° 55' |
| OWNER: | MEC |
| ERECTION DATE: | 1938-40 |

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 5,880 kw |
| Normal operating capacity: | 5,000 kw |
| Operating capacity 1944-45: | 4,500 kw |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 880 | 3.3 | Lungstrom | Mitsubishi |
| 1 | 5,000 | 3.3 | Lungstrom | Mitsubishi |

BOILERS:

| Number | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 72 | 16.2 | 365 | 4 drum | Mitsubishi | Stoker |
| 1 | 15.4 | 22.5 | 382 | Takuma | Osakakisha | Stoker |
| 1 | 30 | 23 | 385 | 3 drum vertical | Mitsubishi | Stoker |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 5,880 kw |
| CAPACITY OPERATIVE: | Probably 4,500 kw |
| SOURCE: | MEC officials in Changchun July 1946 |
| REMARKS: | Titao coal cakes heavily in these boilers |

## TUHSI

| | |
|---|---|
| LOCATION: | Tuhsi |
| Province | Kirin |
| Latitude | 43° 55' |
| Longitude | 131° 00' |
| OWNER: | MEC |
| ERECTION DATE: | |

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 2,700 kw |
| Normal operating capacity: | |
| Operating capacity 1944-45: | |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 1,200 | 3.3 | | |
| 1 | 1,500 | 3.3 | | |

BOILERS:

| Number | Capacity |
|---|---|

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 2,700 kw |
| CAPACITY OPERATIVE: | Probably 1,500 kw |
| SOURCE: | Data listed only on MEC Transmission Charts from Tokyo. |

# CHIENKOUCHI

| | |
|---|---|
| **LOCATION:** | Chienkouchi |
| Province | Kirin |
| Latitude | 45° 10' |
| Longitude | 124° 48' |

**OWNER:** MEC

**ERECTION DATE:** 1938

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity: | 800 kw |
| Normal operating capacity: | 700 kw |
| Operating capacity 1944-45: | 600 kw |

**GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 375 | 2.3 | | AEG |
| 1 | 625 | 2.3 | | Shibaura |

**RECIPROCATING STEAM ENGINES:**

| Number | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 5 | 12 | 280 | WIF | B & M and | |
| 1 | 7 | 12 | 250 | WIF | WH ALLENSON | |

**REMOVALS:** No information

**CAPACITY REMAINING:** Probably 800 kw

**CAPACITY OPERATIVE:** Probably 600 kw

**SOURCE:** MEC officials in Changchun July 1946

**REMARKS:** 700 kw can be obtained by using 6,000 cal/kg coal in lieu of 5,000 cal/kg coal.

# FUCHIN

LOCATION: Fuchin
Province: Kirin
Latitude: 47° 20'
Longitude: 132° 00'

OWNER: MEC

ERECTION DATE: 1936-37

EQUIPMENT:

Rated capacity: 560 kw

TURBO GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 240 | 3.3(?) | 1 cycle single flow | GE |
| 2 | 160 | 3.3(?) | engine generator | ? |

BOILERS:

| Number | Capacity | Steam Pressure Kg/sq.cm. | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 5 | 10 | 183 | WIF | B & W | Stoker |
| 1 | 7 | 10 | 183 | WIF | B & W | Stoker |
| 1 | 9 | 10.7 | 260 | 4 drum sterling | Heine | Stoker |

REMOVALS: No information

CAPACITY REMAINING: Probably 560 kw

CAPACITY OPERATIVE: Estimated 350 kw

SOURCE: MEC officials in Changchun July 1946

REMARKS: One 160 kw generator needs repair.

# ILAN

| | |
|---|---|
| **LOCATION:** | Ilan |
| Province | Kirin |
| Latitude | 46° 20' |
| Longitude | 129° 38' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | |
| **EQUIPMENT:** | |
| Rated capacity | 600 kw |

**TURBO-GENERATORS:**

| Number | KW |
|---|---|
| 1 | 600 |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 600 kw |
| **CAPACITY OPERATIVE:** | Estimated 350 kw |
| **SOURCE:** | Data listed only on MEC Transmission charts from Tokyo |
| **REMARKS:** | |

# IMIENPO

| | | |
|---|---|---|
| LOCATION: | Imienpo | |
| Province | Kirin | |
| Latitude | 45° | 05' |
| Longitude | 128° | 09' |
| OWNER: | MEC | |
| ERECTION DATE: | 1943 | |
| EQUIPMENT: | | |
| Rated capacity | 200 | kw |
| Normal operating capacity | 200 | kw |
| Operating capacity 1944-45 | 200 | kw |

GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 250 | 3.3 | | A.E.G. |

RECIP. STEAM ENGINE:

| Number | Capacity | Steam Pressure | Steam Temp. | Maker |
|---|---|---|---|---|
| 1 | 415 HP | 15 kg/sq.cm | 350 °C. | Woef |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 200 kw |
| CAPACITY OPERATIVE: | Probably 200 kw |
| SOURCE: | MEC Officials in Changchun, July, 1946 |
| REMARKS: | MEC transmission charts from Tokyo indicate that this plant had 1 - 200 kw and 1 - 100 kw unit at 300 volts. |

# NUNGAN

| | |
|---|---|
| **LOCATION:** | Nungan |
| Province | Kirin |
| Latitude | 44° 26' |
| Longitude | 125° 11' |

| | |
|---|---|
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1927 (78 HP) - 1944 (125 HP) |

| | |
|---|---|
| **EQUIPMENT:** | |
| Rated capacity | 162 kw |
| Normal operating capacity | 150 kw |
| Operating capacity 1944-45 | 100 kw |

**GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 78 | 0.4 | | Seimans |
| 1 | 125 | 3.15 | | Seimans |

**RECIP. STEAM ENGINES:**

| Number | Capacity | Steam Pressure | Steam Temp. | Maker |
|---|---|---|---|---|
| 1 | 135 HP | 12 kg/sq.cm | 350° C. | Woef |
| 1 | 145 HP | | 310° C. | Marshall |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 162 kw |
| **CAPACITY OPERATIVE:** | Probably 100 kw |
| **SOURCE:** | MEC officials in Changchun, July, 1946 |
| **REMARKS:** | One boiler requires repair which will bring up output to 150 kw. |

# SANCHAHO

| | |
|---|---|
| LOCATION: | Sanchaho |
| Province | Kirin |
| Latitude | 45° 00' |
| Longitude | 126° 00' |

OWNER: MEC

ERECTION DATE: 1938

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 146 kw |
| Normal operating capacity: | 140 kw |
| Operating capacity 1944-45: | 140 kw |

GENERATORS:

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 110 | 3.15 | | Siemans |
| 1 | 72 | 3.0 | | Siemans |

RECIP. STEAM ENGINE:

| Number | Cap. HP | Steam Pressure kg/sq.cm | Steam Temp. °C | Maker |
|---|---|---|---|---|
| 1 | 235 | 15 | 330 | Woef |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 146 kw |
| CAPACITY OPERATIVE: | Probably 140 kw |
| SOURCE: | MEC officials in Changchun, July 1946 |
| REMARKS: | |

# SUNGHUACHIANG

| | |
|---|---|
| **LOCATION:** | Sunghuachiang |
| Province | Kirin |
| Latitude | 44° 45' |
| Longitude | 125° 55' |

**OWNER:** MEC

**ERECTION DATE:** 1941

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 65 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

**GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 74 | 3.3 | TAK | Shibaura |

**DIESEL ENGINE:**

| Number | Cap. HP | Stroke m/m | Diam.of cyl. m/m | No.of cyl. | Maker |
|---|---|---|---|---|---|
| 1 | 100 | 360 | 225 | 3 | Nigata |

**REMOVALS:** No information

**CAPACITY REMAINING:** Probably 65 kw

**CAPACITY OPERATIVE:** Estimated 35 kw

**SOURCE:** MEC officials in Changchun, July 1946

**REMARKS:**

# TEHUI

**LOCATION:** Tehui
- Province: Kirin
- Latitude: 44° 31'
- Longitude: 125° 43'

**OWNER:** MEC

**ERECTION DATE:** 1934

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 96 kw |
| Normal operating capacity | 90 kw |
| Operating capacity 1944-45 | 90 kw |

**GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 120 | 3.3 | | G.E. |

**RECIP. STEAM ENGINE:**

| Number | Cap. kw | Steam Pressure Kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 100 | 12 | 320 | | ASM | |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 96 kw |
| CAPACITY OPERATIVE: | Probably 90 kw |
| SOURCE: | MEC officials in Changchun, July 1946 |

# WANGCHING

| | |
|---|---|
| **LOCATION:** | Wangchin |
| Province | Kirin |
| Latitude | 43° 18' |
| Longitude | 129° 50' |

**OWNER:** MEC

**ERECTION DATE:** 1942

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity: | 100 kw |
| Normal operating capacity: | 0 kw |
| Operating capacity 1944-45: | 30 kw |

**GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 125 | 3.3 | | Hitachi |

**RECIP. STEAM ENGINE:**

| Number | Cap. HP | Steam Pressure kg/sq.cm | Steam Temp. °C | Maker |
|---|---|---|---|---|
| 1 | 150 | 12 | 300 | Woef |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 100 kw |
| **CAPACITY OPERATIVE:** | None |
| **SOURCE:** | MEC officials in Changchin, July 1946 |
| **REMARKS:** | Very old machine |

# WUCHANG

| | |
|---|---|
| **LOCATION:** | Wuchang |
| Province | Kirin |
| Latitude | 44° 55' |
| Longitude | 127° 08' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | |

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity: | 176 kw |
| Normal operating capacity: | 160 kw |
| Operating capacity 1944-45: | 160 kw |

**GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 75 | 3.3 | | B.B.C. |
| 1 | 145 | 3.3 | | Seimans |

**RECIP. STEAM ENGINE:**

| Number | Cap. | Steam Pressure kg/sq.cm | Steam Temp. °C | Maker |
|---|---|---|---|---|
| 1 | 100 | 12 | 360 | Woef |
| 1 | 150 | 15.5 | 350 | B.M. |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 176 kw |
| **CAPACITY OPERATIVE:** | Probably 160 kw |
| **SOURCE:** | MEC officials in Changchun, July 1946 |
| **REMARKS:** | Boiler for the 145 kw generator, B&W, WIF type 3.5 t/hr; machinery is old. |

# YUSHU

LOCATION: Yushu
Province: Kirin
Latitude: 44° 50'
Longitude: 126° 30'

OWNER: MEC

ERECTION DATE:

EQUIPMENT:
Rated capacity: 30 kw
Normal operating capacity: 30 kw
Operating capacity 1944-45: 30 kw

GENERATORS:

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 37 | .22 | | |

RECIP. STEAM ENGINE:

| Number | Cap. HP |
|---|---|
| 1 | 75 |

REMOVALS: No information

CAPACITY REMAINING: Probably 30 kw

CAPACITY OPERATIVE: Probably 30 kw

SOURCE: MEC officials in Changchun, July 1946

REMARKS: MEC transmission charts from Tokyo indicate 1 x 75 kw and 1 x 33 kw, 3.3 kv

# MANCHU ASANO CEMENT COMPANY (KIRIN)

| | |
|---|---|
| LOCATION: | Kirin |
| Province | Kirin |
| Latitude | 43° 51' |
| Longitude | 126° 33' |
| OWNER: | Manchu Asano Cement Company |
| ERECTION DATE: | 1933 |

EQUIPMENT:

Rated capacity: 7,000 kw

TURBO-GENERATORS:

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 3,500 | | | |

BOILERS:

Firing: Waste gas

| | |
|---|---|
| REMOVALS: | 7,000 kw<br>2 x 3,500 kw generators<br>Auxiliary Equipment |
| CAPACITY REMAINING: | None |
| CAPACITY OPERATIVE: | None |
| SOURCE: | Direct observation of Pauley Mission, MEC Officials and Cement Association officials in Changchun, July 1946 |
| REMARKS: | See File 303-H-1 and 9-H-1 for plant inspection report and supplementary data. |

# TOMAN CEMENT COMPANY

| | |
|---|---|
| LOCATION: | Miaoling - near Wangching |
| Province | Kirin |
| Latitude | 43° 18' |
| Longitude | 129° 47' |
| OWNER: | Toman Cement Company |
| ERECTION DATE: | 1943 |

EQUIPMENT:

Rated capacity: 6,000 kw

TURBO-GENERATORS:

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 3,000 | | | |

BOILERS:

Firing: Waste gas

| | |
|---|---|
| REMOVALS: | 3,000 kw probably removed. |
| CAPACITY REMAINING: | Probably none |
| CAPACITY OPERATIVE: | Probably none |
| SOURCE: | MEC officials and the Cement Association in Changchun, July 1946 |
| REMARKS: | See file No. 303-H-1 for supplementary data. |

# MANCHURIA SYNTHETIC PETROLEUM COMPANY

| | |
|---|---|
| LOCATION: | Kirin |
| Province | Kirin |
| Latitude | 43° 51' |
| Longitude | 126° 33' |
| OWNER: | Manchuria Synthetic Petroleum Company |
| ERECTION DATE: | 1943 |

EQUIPMENT:
Rated capacity: 18,000 kw

TURBO-GENERATORS:

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 9,000 | | | |

BOILERS:

| Number | Cap. T/hr |
|---|---|
| 2 | 40 |

| | |
|---|---|
| REMOVALS: | 18,000 kw<br>2 x 9,000 kw<br>Auxiliary equipment of boilers. |
| CAPACITY REMAINING: | None |
| CAPACITY OPERATIVE: | None |
| SOURCE: | Direct observation of Pauley Mission, Tokyo records, Chinese Economic officials and local officials, July 1946 |
| REMARKS: | See file No. 9-E-1 for plant inspection report. |

# ORIENTAL PULP COMPANY

LOCATION: Shihhsien
  Province Kirin
  Latitude 43° 00'
  Longitude 129° 50'

OWNER: Oriental Pulp Company

ERECTION DATE:

EQUIPMENT:
  Rated capacity: 2,700 kw

REMOVALS: No information

CAPACITY REMAINING: Probably 2,700 kw

CAPACITY OPERATIVE: Estimated 2,000 kw

SOURCE: Data listed only on MEC transmission charts from Tokyo

REMARKS:

# MANCHU PULP COMPANY

| | |
|---|---|
| LOCATION: | Hailin |
| Province | Kirin |
| Latitude | 44° 33' |
| Longitude | 129° 25' |
| OWNER: | Manchu Pulp Company |
| ERECTION DATE: | |
| EQUIPMENT: | |
| Rated capacity: | 3,000 kw |
| REMOVALS: | Possibly 3,000 kw<br>This is not considered reliable |
| CAPACITY REMAINING: | Possibly 3,000 kw |
| CAPACITY OPERATIVE: | Estimated 2,200 kw |
| SOURCE: | MEC officials in Changchun, July 1946 |
| REMARKS: | |

# TOYO PULP COMPANY

| | |
|---|---|
| LOCATION: | Wangching |
| Province | Kirin |
| Latitude | 43° 19' |
| Longitude | 129° 50' |
| OWNER: | Toyo Pulp Company |
| ERECTION DATE: | |
| EQUIPMENT: | |
| Rated capacity | 2,000 kw |
| REMOVALS: | NO INFORMATION |
| CAPACITY REMAINING: | Probably 2,000 kw |
| CAPACITY OPERATIVE: | Estimated 1,500 kw |
| SOURCE: | MEC officials in Changchun, July, 1946 |
| REMARKS: | |

# NICKIMAN PULP COMPANY

| | |
|---|---|
| LOCATION: | Jihman |
| Province | Kirin |
| Latitude | |
| Longitude | |
| OWNER: | Nickiman Pulp Company |
| ERECTION DATE: | |
| EQUIPMENT: | |
| Rated capacity | 1,000 kw |
| CAPACITY REMAINING: | Probably 1,000 kw |
| CAPACITY OPERATIVE: | Estimated 700 kw |
| SOURCE: | MEC officials in Changchun, July, 1946 |
| REMARKS: | |

# TOMAN PULP COMPANY

| | |
|---|---|
| **LOCATION:** | Kaishantung, near Wangchung |
| Province | Kirin |
| Latitude | 43° 18' |
| Longitude | 129° 47' |
| **OWNER:** | Toman Pulp Company |
| **ERECTION DATE:** | |
| **EQUIPMENT:** | |
| Rated capacity | 1,800 kw |
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 1,800 kw |
| **CAPACITY OPERATIVE:** | Estimated 1,000 kw |
| **SOURCE:** | MEC officials in Changchun, July, 1946 |
| **REMARKS:** | |

# POWER PLANTS IN HEILUNGKIANG

## MEC PLANTS:

### Greater than 1,000 kw:

Chalianoerh
Hailar
Haokang
New Sunwu
Old Sunwu
Peian
Tsitsihar

### Less than 1,000 kw:

Aerhshan
Anta
Chalantun
Chaotung
Hailun
Heiho
Mientuho
Nenchiang
Nobo
Payen
Pokotu
Tailai
Tungho

# CHALIANOERH

| | |
|---|---|
| **LOCATION:** | Chalianoerh |
| Province | Heilungkiang |
| Latitude | 49° 35' |
| Longitude | 116° 45' |

**OWNER:** MEC

**ERECTION DATE:** 1937-1943

| | |
|---|---|
| **EQUIPMENT:** | |
| Rated capacity | 5,200 kw |
| Normal operating capacity | 4,400 kw |
| Operating capacity 1944-45 | 2,000 kw |

**TURBO-GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 1400 | 3.3 | Lungstrom | STAL & ASES |
| 1 | 2800 | 3.3 | " | " " |
| 1 | 1000 | 3.3 | 1 cyl. single flow | Gen. Electric |

**BOILERS:**

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 9 | 14.2 | 280 | Stirling | Heine | - - |
| 1 | 13 | 15 | 350 | Yallow | Hitachi | - - |

**REMOVALS:** No information

**CAPACITY REMAINING:** Probably 5,200 kw

**CAPACITY OPERATIVE:** Probably 2,000 kw

**SOURCE:** MEC officials in Changchun, July 1946

**REMARKS:** The 2,800 kw machine was newly installed and had not yet made trial runs.

# HAILAR

| | |
|---|---|
| LOCATION: | Hailar |
| Province | Heilungkiang |
| Latitude | 48° 10' |
| Longitude | 119° 45' |
| OWNER: | MEC |
| ERECTION DATE: | 1937-1943 |
| EQUIPMENT: | |
| Rated capacity | 3,600 kw |
| Normal operating capacity | 3,500 kw |
| Operating capacity 1944-45 | 3,500 kw |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 2 | 15,000 | 3.3 | 1 cyl. single flow | Ishikawashima |
| 1 | 640 | 3.3 | 1 cyl. single flow | and Shibaura |

BOILERS:

| Number | Cap. T/hr | Steam Pressure kg/sq.cm. | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 12.0 | 15 | 350 | CTM | TBK | Stoker |
| 1 | 7.5 | " | " | CT | B&W | " |
| 1 | 13.0 | " | " | Yallow | Hitachi | " |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 3,600 kw |
| CAPACITY OPERATIVE: | Probably 3,500 kw |
| SOURCE: | MEC officials in Changchun, July, 1946 |
| REMARKS: | - - - |

# HAOKANG

| | |
|---|---|
| LOCATION: | Haokang |
| Province | Heilungkiang |
| Latitude | 43° 30' |
| Longitude | 130° 20' |
| OWNER: | MEC |
| ERECTION DATE: | 1936-1940 |
| EQUIPMENT: | |
| Rated capacity | 4,900 kw |
| Normal operating capacity | 3,700 kw |
| Operating capacity 1944-45 | 2,000 kw |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 1875 | 3.3 | 1 cyl. single flow | GW and Seiman |
| 2 | 1500 | 3.3 | 1 cyl. single flow | GW and Seiman |

BOILERS:

| Number | Cap. T/hr | Steam Pressure kg/sq.cm. | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 9.5 | 15 | 350 | WIF | B&W | Stoker and pulverized coal |
| 1 | 14.0 | 17 | 250 | WIF | B&W | |
| 1 | 12.0 | 15 | 350 | Stirling | Heine | |
| 2 | 14.0 | 14 | 316 | WIF | B&W | " |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 4,900 kw |
| CAPACITY OPERATIVE: | Probably 2,000 kw |
| SOURCE: | MEC officials in Changchun, July, 1946 |
| REMARKS: | 3,700 kw can be obtained by using 5,500 cal/kg coal instead of 4,500 cal/kg coal. |

# NEW SUNWU

| | |
|---|---|
| **LOCATION:** | Sunwu |
| Province | Heilungkiang |
| Latitude | 49° 30' |
| Longitude | 127° 30' |

**OWNER:** MEC

**ERECTION DATE:** 1943

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 4,500 kw |
| Normal operating capacity | 4,500 kw |
| Operating capacity 1944-45 | 4,500 kw |

**TURBO-GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 4,550 | 3.3 | 1 cyl. single flow | Ishikawashima and Shibaura |

**BOILERS:**

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 20 | 15 | 350 | CTM | TBK | — |

**REMOVALS:** No information

**CAPACITY REMAINING:** Probably 4,500 kw

**CAPACITY OPERATIVE:** Probably 4,500 kw

**SOURCE:** MEC officials in Changchun, July 1946

**REMARKS:** It was planned to add another 4,500 kw machine during 1946 and upon completion scrap the old Sunwu plant.

# OLD SUNWU

| | |
|---|---|
| **LOCATION:** | Sunwu |
| Province | Heilungkiang |
| Latitude | 49° 30' |
| Longitude | 127° 30' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1937-42 |

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 2,000 kw |
| Normal operating capacity | 2,000 kw |
| Operating capacity 1944-45 | 2,000 kw |

**TURBO-GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 400 | 3.3 | 1 cyl. single flow | General Electric |
| 1 | 800 | 3.3 | 1 " " " | BBC |
| 1 | 800 | 3.3 | 1 " " " | MV |

**BOILERS:**

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 10.5 | 10.5 | 290 | WIF | B&W | Stoker |
| 1 | 12.0 | 15.0 | 350 | CTM | TBK | " |
| 2 | 3.6 | 11.3 | 320 | WIF | B&W | " |
| 2 | 4.0 | 14.0 | 220 | WIF | B&W | " |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 2,000 kw |
| **CAPACITY OPERATIVE:** | Probably 2,000 kw |
| **REMARKS:** | MEC plans were to scrap this plant when the new Sunwu plant was completed. |

# PEIAN

| | |
|---|---|
| LOCATION: | Peian |
| Province | Heilungkiang |
| Latitude | 48° 12' |
| Longitude | 126° 38' |
| OWNER: | MEC |
| ERECTION DATE: | 1939-43 |

EQUIPMENT:

| | |
|---|---|
| Rated capacity | 3,900 kw |
| Normal operating capacity | 3,600 kw |
| Operating capacity 1944-45 | 3,600 kw |

TURBO-GENERATORS:

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 1,500 | 3.3 | 1 cyl. single flow | EW & Mitsubishi |
| 1 | 880 | 3.3 | Lungstrom | Mitsubishi |

BOILERS:

| Number | Cap. | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 7.2 | 16.2 | 365 | Garbe | Mitsubishi | Stoker |
| 1 | 9 | 14 | 350 | Takana | Kishakaisha | |
| 2 | 12 | 15 | 350 | CTM | TBK | |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 3,900 kw |
| CAPACITY OPERATIVE: | Probably 3,600 kw |
| SOURCE: | MEC officials in Changchun, July 1946 |
| REMARKS: | |

## TSITSIHAR

| | |
|---|---|
| **LOCATION:** | Tsitsihar |
| Province | Heilungkiang |
| Latitude | 47° 20' |
| Longitude | 123° 57' |

**OWNER:** MEC

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 8,400 kw |
| Normal operating capacity | 7,000 kw |
| Operating capacity 1944-45 | 7,000 kw |

**TURBO-GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 3 | 2,800 | 3.3 | Lungstrom | Mitsubishi |

**BOILERS:**

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 20 | 14.6 | 350 | Vertical Heine | Heine | Stoker |
| 1 | 20 | 15 | | Sectional | Vitakovia | " |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 8,400 kw |
| **CAPACITY OPERATIVE:** | Probably 7,000 kw |
| **SOURCE:** | MEC officials in Changchun, July 1946 |
| **REMARKS:** | All the machines are old and in poor condition. |

# AERHSHAN

| | |
|---|---|
| LOCATION: | Aerhshan |
| Province | Heilungkiang |
| Latitude | 47° 15' |
| Longitude | 120° 00' |

OWNER: MEC

ERECTION DATE: 1942-43

EQUIPMENT:

| | |
|---|---|
| Rated capacity | 400 kw |
| Normal operating capacity | 200 kw |
| Operating capacity 1944-45 | 200 kw |

GENERATORS:

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 250 | 3.3 | | Hitachi |

RECIP. STEAM ENGINE:

| Number | Cap. HP | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 315 | 13 | 300 | | Hitachi | |

REMOVALS: No information

CAPACITY REMAINING: Probably 400 kw

CAPACITY OPERATIVE: Probably 200 kw

SOURCE: MEC officials in Changchun, July 1946

REMARKS: One set requires repair.

# ANTA

**LOCATION:** Anta
Province Heilungkiang
Latitude 46° 25'
Longitude 125° 20'

**OWNER:** MEC

**ERECTION DATE:**

**EQUIPMENT:**
Rated capacity 170 kw
Normal operating capacity
Operating capacity 1944-45

**STEAM-GENERATORS:**

| Number | KW |
|---|---|
| 1 | 170 |

**REMOVALS:** No information

**CAPACITY REMAINING:** Probably 170 kw

**CAPACITY OPERATIVE:** Estimated 95 kw

**SOURCE:** Data listed only on MEC records from Tokyo.

**REMARKS:**

# CHALANTUN

| | |
|---|---|
| **LOCATION:** | Chalantun |
| Province | Heilungkiang |
| Latitude | 48° 02' |
| Longitude | 122° 45' |

**ERECTION DATE:** 1941

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 200 kw |
| Normal operating capacity | 200 kw |
| Operating capacity 1944-45 | 200 kw |

**GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 250 | 3.3 | | Fuji-denki |

**RECIP. STEAM ENGINE:**

| Number | Cap. HP | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 415 | 15 | 350 | | Woef | |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 200 kw |
| **CAPACITY OPERATIVE:** | Probably 200 kw |
| **SOURCE:** | MEC officials in Changchun, July 1946 |
| **REMARKS:** | |

# CHAOTUNG

| | |
|---|---|
| **LOCATION:** | Chaotung |
| Province | Heilungkiang |
| Latitude | 46° 05' |
| Longitude | 126° 00' |

| | |
|---|---|
| **OWNER:** | MEC |
| **ERECTION DATE:** | |

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 87 kw |
| Normal operating capacity | 70 kw |
| Operating capacity 1944-45 | 70 kw |

**GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 54 | .235 DC | | |
| 1 | 33 | .235 DC | | |

**RECIP. STEAM ENGINE:**

| Number | Cap. | Steam Pressure kg/sq.cm | Maker |
|---|---|---|---|
| | ? | 11 | Marshal |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 87 kw |
| **CAPACITY OPERATIVE:** | Probably 70 kw |
| **SOURCE:** | MEC officials in Changchun, July 1946 |
| **REMARKS:** | |

# HAILUN

|  |  |
|---|---|
| **LOCATION:** | Hailun |
| Province | Heilungkiang |
| Latitude | 47° 30' |
| Longitude | 127° 00' |

**OWNER:** MEC

**ERECTION DATE:** 1936

**EQUIPMENT:**

|  |  |
|---|---|
| Rated capacity: | 215 kw |
| Normal operating capacity: | 100 kw |
| Operating capacity 1944-45: | 100 kw |

**GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 125 | 3.3 |  | AEG |
| 1 | 90 | 2.3 |  | AEG |

**RECIP. STEAM ENGINE:**

| Number | Cap. kw | Steam Pressure kg/sq.cm | Steam Temp. °C | Maker |
|---|---|---|---|---|
| 1 | 150 | 11 | 360 | AEG |
| 1 | 100 | 12 | 365 | Woef |

**REMOVALS:** No information

**CAPACITY REMAINING:** Probably 215 kw

**CAPACITY OPERATIVE:** Probably 100 kw

**SOURCE:** MEC officials in Changchun, July 1946

**REMARKS:** All machinery old. A B & W boiler 3.9 t/hr. 11 kg/cm, 360° C. is used for the A.E.G. unit.

# HEIHO

| | |
|---|---|
| **LOCATION:** | Heiho |
| Province | Heilungkiang |
| Latitude | 50° 10' |
| Longitude | 127° 35' |
| **OWNER:** | MEC |

**ERECTION DATE:**

**EQUIPMENT:**
Rated capacity 530 kw

**TURBO GENERATORS:**

| NUMBER | KW |
|---|---|
| 1 | 90 |
| 2 | 220 |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 530 kw |
| **CAPACITY OPERATIVE:** | Probably 290 kw |
| **SOURCE:** | Data listed only on MEC transmission chart from Tokyo. |

**REMARKS:**

# MIENTUHO

| | |
|---|---|
| LOCATION: | Mientuho |
| Province | Heilungkiang |
| Latitude | 49° 05' |
| Longitude | 121° 05' |
| OWNER: | MEC |
| ERECTION DATE: | 1942 |

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 200 kw |
| Normal operating capacity: | 200 kw |
| Operating capacity 1944-45: | 200 kw |

GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 250 | 3.3 | | AEG |

RECIPROCATING STEAM ENGINE:

| Number | Capacity | Steam pressure | Steam Temp. | Maker |
|---|---|---|---|---|
| 1 | 415 HP | 15 Kg/sq.cm. | 350° C | Woef |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 200 kw |
| CAPACITY OPERATIVE: | Probably 200 kw |
| SOURCE: | MEC officials in Changchun July 1946 |

REMARKS:

# NENCHIANG

| | |
|---|---|
| LOCATION: | Nenchiang |
| Province | Heilungkiang |
| Latitude | 49° 12' |
| Longitude | 125° 26' |
| OWNER: | MEC |
| ERECTION DATE: | 1937 |

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 500 kw |
| Normal operating capacity: | 200 kw |
| Operating capacity 1944-45: | 200 kw |

GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 250 | 3.5 | | Fuji-denki |
| 1 | 375 | 3.3 | | Okamura |

RECIPROCATING STEAM ENGINE:

| Number | Capacity HP | Steam Pressure Kg/sq.cm. | Steam Temp. | Maker |
|---|---|---|---|---|
| 1 | 415 | 15 | 350° C. | Woef |
| 1 | 400 | 15 | 350° C. | Woef |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 500 kw |
| CAPACITY OPERATIVE: | Probably 200 kw |
| SOURCE: | MEC officials in Changchun July 1946 |
| REMARKS: | Chimney for boilers has broken, MEC Transmission charts from Tokyo indicates 2 x 200 kw units 3,300 volts. |

## NOHO

| | |
|---|---|
| **LOCATION:** | Noho |
| Province | Heilungkiang |
| Latitude | 48° 26' |
| Longitude | 124° 56' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1934-1944 |
| **EQUIPMENT:** | |
| Rated capacity: | 403 kw |

**GENERATORS:**

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 375 | 3.3 | TKA | Shibaura |
| 1 | 93.75 | 3.3 | SE-RD | Hitachi |
| 1 | 34.5 | 3.3 | EE 26- H/100 | Siemans |

**DIESEL ENGINES:**

| Number | Capacity | Stroke | Diam. of Cylinder | No. of cyl. | Maker |
|---|---|---|---|---|---|
| 1 | 300 kw | 450 m/m | 280 | 8 | Nigata |
| 1 | 110 hp | 330 m/m | 220 | 3 | M.A.N. |
| 1 | 44 hp | 150 m/m | 200 | 7 | Crossley |

| | |
|---|---|
| **REMOVALS:** | No information |
| **CAPACITY REMAINING:** | Probably 403 kw |
| **CAPACITY OPERATIVE:** | Estimated 290 kw |
| **SOURCE:** | MEC officials in Changchin July 1946 |
| **REMARKS:** | MEC Transmission charts from Tokyo indicate 1 x 75 kw and 1 x 28 kw units. |

# PAYEN

| | |
|---|---|
| LOCATION: | Payen |
| Province | Heilungkiang |
| Latitude | 46° 05' |
| Longitude | 127° 25' |
| OWNER: | MEC |
| ERECTION DATE: | 1943 |
| EQUIPMENT: | |
| Rated capacity: | 200 kw |

GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 250 | 3.3 | NAP | Yasukawa |

DEISEL ENGINE:

| Number | Capacity | Stroke | Diam. of cylinder | No. of cyl. | Maker |
|---|---|---|---|---|---|
| 1 | 200 kw | 448.5 m/m | 280.5 m/m | 6 | Nigata |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 200 kw |
| CAPACITY OPERATIVE: | Estimated 110 kw |
| SOURCE: | MEC officials in Changchun July 1946 |
| REMARKS: | |

# POKOTU

| | |
|---|---|
| LOCATION: | Pokotu |
| Province | Heilungkiang |
| Latitude | 48° 45' |
| Longitude | 121° 55' |
| OWNER: | MEC |
| ERECTION DATE: | 1937-40 |

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 140 kw |
| Normal operating capacity: | 100 kw |
| Operating capacity 1944-45: | 100 kw |

GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 100 | 3.8 | | AEG |
| 1 | 75 | 3.5 | | BBC |

RECIPROCATING STEAM ENGINE:

| Number | Capacity HP | Steam pressure Kg/sq.cm | Steam Temp. °C. | Maker |
|---|---|---|---|---|
| 1 | 125 | 12 | 330 | Woef |
| 1 | 100 | 12 | 330 | H.U. |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 140 kw |
| CAPACITY OPERATIVE: | Probably 100 kw |
| SOURCE: | MEC officials in Changchun July 1946 |
| REMARKS: | Machinery is old. |

# TAILAI

| | |
|---|---|
| LOCATION: | Tailai |
| Province | Heilungkiang |
| Latitude | 46° 25' |
| Longitude | 123° 30' |
| OWNER: | MEC |
| ERECTION DATE: | 1936-38 |

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 98 kw |
| Normal operating capacity: | 80 kw |
| Operating capacity 1944-45: | 80 kw |

GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 60 | 3.3 | | AEG |
| 1 | 125 | 3.3 | | Siemans |

RECIPROCATING STEAM ENGINE:

| Number | Capacity | Steam pressure | Steam temp. | Maker |
|---|---|---|---|---|
| | ? | 12 Kg/sq.cm. | 350° C. | Woef |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 98 kw |
| CAPACITY OPERATIVE: | Probably 80 kw |
| SOURCE: | MEC officials in Changchun July 1946 |
| REMARKS: | Machinery is old. |

# TUNGHO

| | |
|---|---|
| LOCATION: | Tungho |
| Province | Heilungkiang |
| Latitude | 45° 58' |
| Longitude | 128° 50' |
| OWNER: | MEC |
| ERECTION DATE: | |

EQUIPMENT:

| | |
|---|---|
| Rated capacity: | 200 kw |
| Normal operating capacity: | 200 kw |
| Operating capacity 1944-45: | 200 kw |

GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 200 | 3.3 | | |

RECIPROCATING STEAM ENGINE:

| Number | Capacity | Steam pressure | Steam Temp. | Maker |
|---|---|---|---|---|
| 1 | 415 HP | 15 Kg/sq.cm | 350° C. | Woef |

| | |
|---|---|
| REMOVALS: | No information |
| CAPACITY REMAINING: | Probably 200 kw |
| CAPACITY OPERATIVE: | Probably 200 kw |
| SOURCE: | MEC officials in Changchun July 1946 |

REMARKS:

# POWER PLANTS IN JEHOL

## MEC PLANTS:

### Greater than 1,000 kw:

Fouhsin
Peipiao
Shuangtoushan

### Less than 1,000 kw:

Chihfeng
Lingyuan
Pingchuan
Yuerhyai

# FOUHSIN

LOCATION: Fouhsin
Province Jehol
Latitude 42° 08'
Longitude 121° 34'

OWNER: MEC

ERECTION DATE: 1938-1944

EQUIPMENT:
Rated capacity: 160,000 kw
Normal operating capacity: 120,000 kw
Operating capacity 1944-45: 50,000 kw

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 2 | 27,000 | 11 | 2 cyl. double flow | Sieinans |
| 2 | 53,000 | 11 | " " " " | " |

BOILERS:

| Number | Cap. T/h. | Steam Pressure kg/sq.cm | Steam Temp. °C. | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 9 | 130 | 36 | 440 | CTM | B&W | Pulv. Coal |

REMOVALS:
160,000 kw in operation 100,000 kw of spares
2 - 50,000 kw turbo generators in operation
2 - 50,000 kw " " spares
2 - 27,000 kw " " in operation
9 boilers
4 - 20,000 kva transformers
2 - 3,000 kva "
Auxiliary equipment for above items

CAPACITY REMAINING: None

CAPACITY OPERATIVE: None

SOURCE: Direct observation by Pauley Mission, MEC officials in Changchun and local officials, July 1946.

REMARKS: There was insufficient water in the area for make up water. This limited continuous operating capacity to about 65,000. A continuous capacity of 120,000 kw would be contingent upon developing a water supply. See File No. 21-L-1 for plant inspection report.

# PEIPIAO COAL COMPANY

| | |
|---|---|
| LOCATION: | Peipiao |
| Province | Jehol |
| Latitude | 41° 45' |
| Longitude | 120° 45' |
| OWNER: | MEC |
| ERECTION DATE: | 1940 |
| EQUIPMENT: | |
| Rated capacity | 15,000 kw |
| Normal operating capacity | 12,000 kw |
| Operating capacity 1944-45 | 6,000 kw |

TURBO-GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 15,000 | 11 | 1 cyl. single flow | Ishikawashima |

BOILERS:

| Number | Cap. T/hr. | Steam Pressure kg/sq.cm | Steam Temp. °C | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 2 | 40 | 24 | 400 | CTM | B&W | Stoker |

| | |
|---|---|
| REMOVALS: | None |
| CAPACITY REMAINING: | 15,000 kw |
| CAPACITY OPERATIVE: | 10,000 expected |
| SOURCE: | Direct observation by Pauley Mission, MEC officials in Changchun and local officials, June 1946. |
| REMARKS: | The reduced capacity during 1944-45 was due to use of low grade coal (4500 cal/kg of coal) used. Chinese Communists did slight damage to the generator in May 1946 which is expected to be repaired by August 1946. They have also cut the power lines tying Peipiao with the Fuhsin-Chinhsien power line. See File No. 22-L-1 for plant inspection report. |

# SHUANGTOUSHAN

| | |
|---|---|
| LOCATION: | Shuangtoushan |
| Province | Jehol |
| Latitude | 41° 00' |
| Longitude | 117° 55' |

| | |
|---|---|
| OWNER: | MEC |
| ERECTION DATE: | 1942-1944 |

EQUIPMENT:

| | |
|---|---|
| Rated capacity | 6,000 kw |
| Normal operating capacity | 6,000 kw |
| Operating capacity 1944-45 | 3,000 kw |

TURBO-GENERATORS:

| Number | Kw | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 1,500 | 3.3 | 1 cyl. single flow | Ishikawashima |
| 1 | 3,000 | 3.3 | " | Westinghouse |

BOILERS:

| Number | Cap. T/hr | Steam Pressure kg/sq/cm | Steam Temp. oC | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 4 | 12 | 15 | 350 | Takuma | Kisha Kaisha | Stoker |
| 1 | 15 | 15 | 350 | " | " " | " |

| | |
|---|---|
| REMOVALS: | Probably none |
| CAPACITY REMAINING: | Probably 6,000 kw |
| CAPACITY OPERATIVE: | Probably 3,000 kw |
| SOURCE: | MEC Officials in Changchun and Chinese Economic Commission, July 1946 |
| REMARKS | The 3,000 kw generator is newly installed and has not completed its trial runs. |

# CHIHFENG

LOCATION: Chihfeng
Province Jehol
Latitude 42° 20'
Longitude 119° 00'

OWNER: MEC

ERECTION DATE: 1936-1943

EQUIPMENT:
Rated capacity 500 kw
Normal operating capacity
Operating capacity 1944-45

GENERATORS:

| Number | KW | KV | Type | Maker |
|---|---|---|---|---|
| 1 | 375 | 3.3 | OAF | Meidensha |
| 1 | 250 | 3.3 | " | " |

DIESELS:

| Number | Cap. kw | Stroke m/m | Diam. of cyl. m/m | No. of cyl. | Maker |
|---|---|---|---|---|---|
| 1 | 300 | 400 | 300 | 6 - 2 cycle | Suljer |
| 1 | 200 | 400 | 300 | 4 - 2 " | " |

REMOVALS: Probably none

CAPACITY REMAINING: Probably 500 kw

CAPACITY OPERATIVE: Estimated 300 kw

SOURCE: MEC officials in Changchun, July 1946

REMARKS:

# LINGYUAN

| | |
|---|---|
| LOCATION: | Lingyuan |
| Province | Jehol |
| Latitude | 41° 20' |
| Longitude | 119° 20' |
| OWNER: | MEC |
| ERECTION DATE: | 1943 - 187.5 kw<br>1934 - 93.75 kw |

EQUIPMENT:

| | |
|---|---|
| Rated capacity | 225 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

GENERATORS:

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 187.5 | 3.3 | AEC | Meidensha |
| 1 | 93.75 | 3.3 | TAF | Shibaura |

DIESEL ENGINES:

| Number | Cap. kw | Stroke m/m | Diam.of cyl. m/m | No.of cyl. | Maker |
|---|---|---|---|---|---|
| 1 | 150 | 400 | 300 | 3 - 2 cycle | Sulzer |
| 1 | 75 | 350 | 310 | 2 | Tamatsukuri |

| | |
|---|---|
| REMOVALS: | Probably none |
| CAPACITY REMAINING: | Probably 225 kw |
| CAPACITY OPERATIVE: | Estimated 150 kw |
| SOURCE: | MEC officials in Changchun, July 1946 |
| REMARKS: | |

# PINGCHUAN

| | |
|---|---|
| **LOCATION:** | Pingchuan |
| Province | Jehol |
| Latitude | 41° 00' |
| Longitude | 118° 35' |
| **OWNER:** | MEC |
| **ERECTION DATE:** | 1941 |

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 400 kw |
| Normal operating capacity | 200 kw |
| Operating capacity 1944-45 | 200 kw |

**GENERATORS:**

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 250 | 3.3 | | Fuzi denki |

**RECIP. STEAM ENGINE:**

| Number | Cap. H.P. | Steam Pressure Kg/sq.cm | Steam Temp. °C | Maker |
|---|---|---|---|---|
| 2 | 415 | 15 | 350 | Woef |

| | |
|---|---|
| **REMOVALS:** | Probably none |
| **CAPACITY REMAINING:** | Probably 400 kw |
| **CAPACITY OPERATIVE:** | Probably 200 kw |
| **SOURCE:** | MEC officials in Changchun, July 1946 |
| **REMARKS:** | One generator requires repairs. |

# YUERHYAI

LOCATION: Yuerhyai
Province Jehol
Latitude 40° 30'
Longitude 118° 15'

OWNER: MEC

ERECTION DATE: 1941-1943

EQUIPMENT:
Rated capacity 650 kw
Normal operating capacity
Operating capacity 1944-45

GENERATORS:

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 375 | 3.3 | F485/17 - 250 | Fuji denki |
| 1 | 250 | 3.3 | OAF | Meidensha |
| 1 | 187.5 | 3.3 | " | " |

DIESEL ENGINES:

| Number | Cap. kw | Stroke m/m | Diam.of cyl. m/m | No.of cyl. | Maker |
|---|---|---|---|---|---|
| 1 | 300 | 500 | | 6 | Suljer |
| 1 | 200 | 400 | 300 | 5 | " |
| 1 | 150 | | | | " |

REMOVALS: Probably none

CAPACITY REMAINING: Probably 650 kw

CAPACITY OPERATIVE: Estimated 400 kw

SOURCE: MEC officials in Changchun, July 1946

REMARKS:

# UNLOCATED POWER PLANTS

MEC PLANTS:

Greater than 1,000 kw:

- Mushih
- Shentung

Less than 1,000 kw:

- Chienkouchi
- Chouchangtzu

## MUSHIH

| | |
|---|---|
| LOCATION: | Mushih |
| Province | Unlocated |
| Latitude | " |
| Longitude | " |

OWNER: MEC

ERECTION DATE:

EQUIPMENT:

| | |
|---|---|
| Rated capacity | 3,000 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

TURBO-GENERATORS:

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 2 | 1,500 | 3.3 | | |

REMOVALS: No information.

SOURCE: Data listed only on MEC transmission records from Tokyo.

# SHENTUNG

| | |
|---|---|
| LOCATION: | Unlocated |
| Province | " |
| Latitude | " |
| Longitude | " |
| OWNER: | MEC |
| ERECTION DATE: | 1941-44 |

EQUIPMENT:

| | |
|---|---|
| Rated capacity | 4,300 kw |
| Normal operating capacity | 3,800 kw |
| Operating capacity 1944-45 | 3,800 kw |

TURBO-GENERATORS:

| Number | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 2,800 | 3.3 | Lungstrom | Stal and Asea |
| 1 | 1,500 | 3.3 | 1 cyl. single flow | Ishikawashima Shibaura |

BOILERS:

| Number | Cap. T/hr | Steam Pressure kg/sq.cm | Steam Temp. oC | Type | Maker | Firing |
|---|---|---|---|---|---|---|
| 1 | 12 | 17.6 | 270 | Marine | B & W | |
| 2 | 13 | 15 | 350 | Yallow | Hitachi | |

| | |
|---|---|
| REMOVALS: | No information. |
| SOURCE: | MEC officials in Changchun, July 1946. This is the only plant listed by the source that is not confirmed by MEC transmission charts in Tokyo. |
| REMARKS: | Shentung coal does not burn well as furnace coal. |

# CHIENKOUCHI

| | |
|---|---|
| **LOCATION:** | Unlocated |
| Province | " |
| Latitude | " |
| Longitude | " |

**OWNER:** MEC

**ERECTION DATE:** 1944

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 320 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

**TURBO-GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 4 | 100 | 3.3 | (KAP 100-14-428c) | Kurosaki |

**DIESEL ENGINES:**

| Number | Cap. kw | Stroke m/m | Diam.of Cyl. m/m | No.of Cyl. | Maker |
|---|---|---|---|---|---|
| 4 | 80 | 340 | 230 | 4 | Osaka Hatsudoki |

**REMOVALS:** No information.

**SOURCE:** MEC officials in Changchun July 1946. Two plants of this name and Chinese character are reported. This plant may be the Chienkouchi located in Kirin at 45-1 - 124-48.

# CHOUCHANGTZU (Probably)

| | |
|---|---|
| **LOCATION:** | Unlocated |
| Province | " |
| Latitude | " |
| Longitude | " |

**OWNER:** MEC

**ERECTION DATE:** 1945

**EQUIPMENT:**

| | |
|---|---|
| Rated capacity | 65 kw |
| Normal operating capacity | |
| Operating capacity 1944-45 | |

**GENERATORS:**

| NUMBER | KW | KV | TYPE | MAKER |
|---|---|---|---|---|
| 1 | 82 | 3.3 | (TAK-14) | Shibaura |

**DIESEL ENGINES:**

| Number | Cap. kw | Stroke m/m | Diam.of cyl. m/m | No.of Cyl. m/m | Maker |
|---|---|---|---|---|---|
| 1 | 65 | 280 | 3 | 400 | Nigata |

**REMOVALS:** No information

**SOURCE:** MEC officials in Changchun, July 1946. The second Chinese character for the name is not legible.

**REMARKS:**

# FUSHUN COAL FIELD, MANCHURIA

Location: 50 km east of Mukden.

Date Visited: 3 June 1946

Introduction: The Fushun Coal Field is 50 kilometers (30 miles) east of Mukden, Liaoning Province, Manchuria, on the right bank of Hun-ho (River). The field, which is the most important in Manchuria, is about 19 kilometers long from east to west and 2 kilometers wide from north to south. The present report has drawn on one written in February, 1946, by Gijin Morita, with additions by Hubert G. Schenck and Norman Cleaveland, on notes in the field on June 2, 1946, and on published sources available in Mukden.

History: Old chinaware and coins which were uncovered in the field indicate that the coal was mined by Koreans at least 700 to 800 years ago. During the Kanlung Era, the Government prohibited operations because the mine was too near the tomb of an Emperor. During the 27th year of the Kuangshu Era, the Government granted permission for mining, the first written record of mining in the field—at Laofutai and Chienchinchai.

In the year 1905, Russians occupied the area by military strength—they mined coal at Chienchinchai, Laofutai and Yangpaipu for the Railway. At the close of the Russo-Japanese War, the Japanese army occupied the field. In April 1907, the South Manchurian Railway Company was established and began to operate the mines. In 1907 the output was only 300 metric tons a day from the Chienchinchai, Laofutai and Yangpaipu mines. Later the company opened the Oyama and Togo shafts, and by 1911 the output was increased to 4000 tons per day.

Notable was the year 1915, as that marked the first open cut mining. Operations were commenced at Wantawu and Kuchengtzu. From 1918 to 1920 the second open cut was begun at Lungfeng, Hsintun and Kuchengtzu.

In 1920, the company bought the Taolien mine from the Toyo Coal Mining Company. In 1923 the Higashigaoka open cut mining was begun. In 1924 an extensive plan for open cut operations was adopted. This necessitated moving both a city, consisting of industrial plants, hospital and many offices, and the course of a river. The open cut was continually enlarged and expanded until its present size and depth (160 meters at the deepest part) were reached.

## ANNUAL PRODUCTION
(metric tons)

| | | | |
|---|---|---|---|
| 1907 | 223,325 | 1926 | 6,139,110 |
| 1908 | 490,042 | 1927 | 6,953,982 |
| 1909 | 706,042 | 1928 | 7,197,474 |
| 1910 | 898,482 | 1929 | 7,290,000 |
| 1911 | 1,343,198 | 1930 | 7,259,911 |
| 1912 | 1,470,152 | 1931 | 6,401,470 |
| 1913 | 2,185,453 | 1932 | 5,636,488 |
| 1914 | 2,147,432 | 1933 | 6,945,358 |
| 1915 | 2,169,245 | 1934 | 9,021,033 |
| 1916 | 2,039,578 | 1935 | 8,380,000 |
| 1917 | 2,275,905 | 1936 | 9,593,467 |
| 1918 | 2,521,164 | 1937 | 9,529,693 |
| 1919 | 2,928,186 | 1938 | 9,136,237 |
| 1920 | 3,129,335 | 1939 | 8,918,617 |
| 1921 | 2,727,700 | 1940 | 7,268,200 |
| 1922 | 3,858,629 | 1941 | 6,706,102 |
| 1923 | 4,920,585 | 1942 | 6,358,500 |
| 1924 | 5,538,614 | 1943 | 5,374,292 |
| 1925 | 5,681,006 | 1944 | 4,511,764 |

Source: Report by G. Marita; reliability undetermined but probably good. Discrepancies will be noted upon comparison with the "Manchuria Yearbook", 1941, "Special Report of the Geological Survey of China", 1935, and others. The statistics, however, are in relative agreement.

Geology: The coal fields are in low, rolling hills, ranging in elevation from 150 to 300 meters. To the north of the field is the Hun-ho (river) and its wide, alluvial plain.

The stratigraphy of the region is summarized thus:

| | |
|---|---|
| Quaternary | |
| Alluvium | Sand, clay and gravel, 10-30 m. thick. |
| Diluvium | Sandstone and shale |
| Tertiary - Fushun Group | |
| Upper formations | Coal, oil-shale, green shale. |
| Lower formations | Basalt, tuff, conglomerate, sandstone, shale, coal. Unconformable upon older rocks. |

| | |
|---|---|
| Cretaceous (?) | Purplish shale, gray shale, black shale, and lenticular limestone, resting unconformably upon gneiss. |
| Granitic Gneiss | |

The lower formations of the Fushun group are on the north side of the granitic gneiss at the southern part of the field. The rocks comprise basalt, tuff, sandstone and shale, including 2-3 unimportant coal seams. The total thickness of the group is estimated to be 150 meters. The general trend of these rocks is east to west, with a dip of 20-40° to the north.

The upper formations of the Fushun Group consist of coal, oil shale and green shale, in ascending stratigraphic order. The amber in the coal contains many well-preserved insect fossils, among them being Cecidomyia bujunensis Naora, Exetastes manchuricus Naora, Componotus tokunagai Naora, and Cainoblattinopsis fushunensis Ping.

The common fossil plants are Sequoia chinensis Endo., Glyptostrobus europaeus (Br.) Heer, Fagus feroniae Ung., Alnus Kefersteini Goepp., Quercus drymeja Ung., Carpinus grandis Ung., Planera Ungeri Ett., and Populus occidentalis Lesq. These are Tertiary in age.

The oil shale above the main coal seam averages about 120 meters in thickness. The average oil content is 4-15 percent. The estimated reserves are 5,477 million tons. Production in 1936 totalled 3,648,000 tons. This formation is overlain by green shale, which is more than 200 meters thick.

The general trend of the Fushun group is E-W. The dip is 20-40° north. A hypothetical strike-fault has been mapped on the north side of the field, south of the river. Minor faults and flexures may be observed at several places.

Coal Seams: The coal seams in the lower Fushun group attain a thickness of 0.3 to 15 meters each, but they are all lenticular. At the west end of the field they are better developed, being 6 to 15 meters thick. Here the seams are workable.

The so-called "great coal seam" of the upper Fushun group at Kuchengtzu is about 126 meters thick. The thickness of the seams decreases gradually to the East. At Lungfeng the thickness is about 12 meters, at Taolien 7-10 meters, and at Achinkou, 6 meters. All the coal in the district is bituminous.

**Character of the Coal:**

### TABLE 1

### INDUSTRIAL ANALYSIS OF COAL

| Moisture | Ash | Volatiles | Fixed Carbon | Heat Content (Calories) | Sulfur | |
|---|---|---|---|---|---|---|
| 5.70 | 4.42 | 43.89 | 45.91 | 6870 | 0.67 | |
| 6.08 | 14.07 | 34.85 | 45.00 | 6175 | 0.93 | coking |
| 4.78 | 5.94 | 40.61 | 48.66 | 7046 | 0.46 | |

### TABLE II

### THICKNESS OF COAL AND PARTINGS

| Thickness of Coal (Cm) | Thickness of Partings (Cm) |
|---|---|
| 200 | 10 |
| 230 | 20 |
| 220 | 10 |
| 860 | 80 |
| 600 | 10 |
| 200 | 10 |
| 120 | 10 |
| 190 | 30 |
| 1300 | 40 |
| 130 | 10 |
| 160 | 10 |
| 230 | 80 |
| 100 | 60 |
| 400 | 260 |
| 940 | 200 |
| 480 | 60 |
| 840 | |

**Mining Equipment and Methods:** The coal is mined by both open cut and underground methods. The open cut known as the "West Open Cut" is mined by the multiple bench system. At present this cut is about 160 meters deep. The cut is completely mechanized and electrified but all equipment is old and of inadequate size. The power shovels are from 20 to

30 years old as is the rolling stock. In recent years the excavation of coal has apparently crowded the overburden too closely on the south bank. The result is that several large slides have buried considerable coal as well as operating equipment. The slides continue to be hazard to the efficient operation of the mine. Formerly another open cut mine in this area known as the "East Open Cut" mine was in operation. This mine has been closed down chiefly because it was uneconomic but also because the Soviets removed four of the most modern power shovels.

There are four principal underground mines. The most important of these is the Lungfeng mine which is located on the eastern extremity of the field. This mine produces coal used for making coke. A system of long wall sizing with hydraulic and shale flushing is used in the underground mines. These mines are also completely electrified and equipped with modern mining, hoisting and treating machinery, all of which was left intact by the Soviets, including transformer stations.

We were told that each ton of coal requires about 2.5 man days of labor in the underground mines as against about 4 man days per ton in the open cut. Apparently, no records of the accident rate are maintained; safety devices are scarce. It is reported that about 60,000 persons are employed in this district, at least 50 percent more than can be reasonably kept occupied, the reason being purely sociological and to prevent wholesale unemployment and starvation.

Available production figures of these mines vary widely and are often contradictory. The figures supplied by Mr. Cheng, presently in charge of all the Fushun Mines, are as follows:

| | Average 1945 Monthly Production In Metric Tons | |
|---|---|---|
| | Before Aug. 15 1945 | After Aug. 15 1945 |
| West Open Cut | 176,791 | 98,820 |
| Ta Shan Mine | 60,917 | 13,680 |
| Lao Hu Tai Mine | 72,704 | 26,086 |
| Lungfeng | 67,611 | 11,161 |
| TOTAL | 378,023 | 149,747 |

The reason for the production drop indicated by the above figures is a power shortage caused by the Soviet removals from the Fushun Power Plant; Plant Inspection Report No. 1-L-2 in Appendix 3 covers this power plant.

While visiting the open cut mine we noticed a group of workmen around a large blackboard notice. Inquiry revealed that the men were being informed of efforts to obtain funds to pay them for the month the mine was under Soviet management. The workers received no pay that month.

Selected References:

(1) Inouye, K.
"The Coal Resources of Manchuria", The Coal Resources of the World, Inter. Geol. Congress, Toronto, Vol. I, pp. 248-250, 1913.

(2) Hata, I.
"Explanatory text to geological map of Manchuria, Fengtien sheet", Geol. Inst., South Manchuria Ry, p. 17 (?) 1931.

(3) Tohoku Imperial Univ.
Technical Report, Vol. 8, 1935, Uwatoko, K., Oil Shale of Fushun, Manchuria.

(4) Journal Fac. Sci., Hokkaido
Imper. Univ., Ser. IV, Vol. 1, No. 2, pp. 115-203, 1931.

(5) Jour. Astr. and Geophys. Japan, Vol. 2, 1925.

PREPARED BY

Lt. Col. H. G. Schenck

## YENTAI COLLIERY

Location: 42 km south of Mukden on railroad.

Date Visited: Sunday, 9 June 1946, by Messrs. Hurndall, Taylor, Elias, Shaner, Einig, Johnston and Fenical.

Coal Mine: Anthracite. History: Coal field is an area 8 by 6 km originally worked as individual mines. After Russo-Japanese war Japanese took over and later consolidated this mine with the Fouhsin Company as one of five mines in a group. Present status: Has been idle since March 1946 when Soviets took out electric generators at power station on Yalu River (Supong, Korea). Now negotiating with Cement Plant, Liaoyang to supply power with 2-2200 kva steam turbo-generators of which 500 kw will be furnished to this mine. Nine had own steam driven generators which were removed by Japanese some time ago. No power source at present.

Mine Workings: The coal mine lies in 4 seams varying from 0.8 to 2.2 m. thick and dipping 35 to 40 degrees. Three seams were worked, some places as individual seams and in other places all three together. The long face method of mining is used. Layers of shale varying from 1 to 2 meters separate the coal seams. Veinlets of pyrite are found in with the coal and on the shale contacts. The upper seam is the thickest and varies from 2 to 2.2 meters.

There are 8 separate pits 5 of which are in producing condition. Adequate provision is made for ventilation of the working faces, for pumping water, and for underground haulage.

Some coarse shale was sorted from the coal in the mine and used as backfill.

Mine timbers are used extensively. At present there is a 30 day supply on hand. These timbers had come from communist held territory north of Harbin so at present additional supplies are not available. Bricks were used for back support in order to conserve timbers. The shortage of mine timbers may handicap production from this mine after power is obtained.

Coal Production: Normally about 1000 tons per day of coal are produced employing 1200 men underground and 500 to 600 surface workers. Peak production was 400,000 tons in 1942. Pneumatic coal picks and jack hammers but no coal cutters are used. A work face of 30 to 50 meters is advanced 0.9 meters per day yielding 40 to 60 tons of coal. Capacity per man per day at each work face is 1.8 tons.

On the surface the coal was screened, 80 percent of the fines were briquetted and sold to the railroad. The rest was sold to factories in Mukden to domestic consumers.

Clay and Pyrite Production: The seams of shale between the coal beds contain clay which is also mined and marketed as a fire clay in Mukden and Fouhsin.

Pyrite, as sorted from the coal on the picking belt, is sold to a sulphuric acid plant in Fushun.

Production Statistics:

| Year | Lump Coal | Coal Briquettes | Pyrite | Fire Clay |
|---|---|---|---|---|
| 1942 | 404,000 | 190,000 | 2,022 | 11,335 |
| 1943 | 396,000 | 168,000 | 2,646 | 12,447 |
| 1944 | 367,000 | 90,560 | 2,104 | 11,364 |
| 1945 | 211,810 | 23,550 | 1,242 | 1,000 |
| 1946 | 100,000 | -- | 400 | -- |

The coal is a semi-anthracite of good grade and analyses 66 percent fixed carbon, 12 percent volatile, 20 percent ash, 1 percent moisture, 2 percent sulfur and contains 7000 cal. per gram. The cost of the coal under the Japanese was 20 yen per ton.

Treatment: Coal is hoisted to the surface in mine cars which are transferred to the treatment plant by electric locomotives. At the treatment plant coarse waste and pyrite are handpicked from the coal. About 80 percent of the fines (-1/2") are screened out, mixed with 10-percent pitch and briquetted in 4 rolls type briquetting machines each with a capacity of 10 tons per hour.

Lump coal goes to storage bins for loading into railroad cars while the briquettes pass to separate bins for loading locomotive tenders.

The surface plant normally works two 6-hour shifts and the mine three shifts.

Power: Normally the mine uses 1200 kw per day.

Power is brought to the substation at 22,000 volts and stepped down to 2200 volts in three 1000 kva transformers. 2000 kva is the peak load.

Two rotary converters of 50 kva capacity each are used to convert alternating current to direct for use in the tram system.

Employees: Under the Japanese the workers at the colliery were furnished houses and supplies at cost which was deducted from their pay. The average worker received 2 yen per day.

At present the workers are supplied with minimum provisions as advance towards resumption of operations. About 1000 workers of which 300 are Japanese are maintained. Plans are to repatriate all the Japanese except about 20 of the technical staff. Management is now in the hands of Mr. Hani, Chinese. The Japanese deported themselves well in preserving property and equipment after the war's end and during the Soviet occupation, which fact stands them well with the Chinese at present.

War Damage: No removal of equipment nor other damage was suffered by this mine due to the various wars.

Mine operations were conducted in a workmanlike manner and not gutted to increase production.

Comments: Electric power is the vital need of this plant. While efforts are being made to obtain temporary power, full production will not be reached until normal requirements are supplied.

During the present idle period equipment is being maintained and repaired. No damage from water in the mine is expected.

No underground inspection was made due to the danger of gas in the mine.

While the Soviets removed nothing from this colliery, their removal of the electric generator at such power plants as SuiHo on the Yalu River, has hamstrung operations. If and when power is supplied to this colliery, it can resume operations very easily. Coal from this mine will greatly assist other industries in this area in resuming operations.

PREPARED BY

T. L. Johnston

# MISHAN COAL MINING COMPANY

(formerly owned by the Manchurian Heavy Industry Company and Japan Iron Refining Company)

Location: These 4 mines are in the areas of Mashan, Titae, Hengshan, and Chihsi--all about 70 miles northeast of Mutanchiang.

Note: The mines were not visited by the Pauley Mission, but information on them was obtained from Japanese sources in Changchun, 4 July 1946, by Carleton B. Swift, Jr.

Source and Reliability of Information: Mayeshima, Goichi, Director of Advisory Board for Manchurian Coal Mining, head offices in Changchun. Board supervised the development of mine from 1934 to 1945. Personally visited by Mayeshima in 1938.

Date Put in Operation: Mine surveyed in 1934 by Manchu Coal Mine Company; coal first produced in 1936 under Mishan Coal Mining Company.

Description of Product: All four mines produce coking coal.

Best Previous Production and Year (or Capacity): 1944 produced 3,000,000 metric tons of coking coal. Production was increasing each year.

Plant Equipment: Usual mining equipment. Mining by inclines exclusively coal seam on 23 degree dip for all mines, area faulted bringing series of ourcrops. Coal found in 5 or 6 layers each 1 to 3 meters thick.

Number of Employees at Full Operation: 30,000

Removals and Dates: Most of the Japanese and he believes most of the Chinese labor evacuated the area in August '45. No knowledge of removals has filtered through to source.

Destruction and Dates: Partial destruction by Japanese military forces in August. Destruction was not heavy for lack of time.

Stockpiles: Finished products; - 120,000 metric tons coal stockpiled in August '45.

Former distribution of product: All coal except for local use went to Chongjin, Korea for use in iron and steel mills there.

Immediate Future Demands for Product: Unreliable report of mayor of Mutanchiang stated that this mine was being run by the railroad.

Names of Former Plant Manager: Fujii, Chohichiro. This man was in Changchun 4 July 1946.

Notes on Process: Source considers the mine and equipment to be efficient and economic. The drawback to economic competition is the cost of transportation for product.

Remarks: Coal reserves are estimated to be 900,000,000 metric tons in the 4 mines. A 2,000 square mile area 50 miles to the NE was being surveyed for coal. In Lichinweitzu 100 miles to the North coal reserves are estimated at 100,000,000 metric tons. Coal is also reported on the RR 50 miles to the east of the Mishan mines.

PREPARED BY

Carlton B. Swift, Jr.

# FOUHSIN COAL MINE

**Location:** Fouhsin District of the Chinchow Province

**Date Visited:** 8 June 1946, by Norman Cleaveland and Carleton B. Swift, Jr. in company with Mr. Powers A. Lay, a Chinese director of coal mines for the Ministry of Economic Affairs; Mr. H. Y. Kuo, manager of the mines; former Japanese manager of the mines; and a staff of Chinese and Japanese engineers connected with the present operations.

This field is about 20 km. long and 8 km. wide. Prior to the Japanese development of the coal fields in 1937, Fouhsin was a small village. In August 1945 it was reported as having a population of about 200,000 - 100,000 of whom were of persons directly connected with the mines and associated industries. Thirty-eight thousand persons were reported as being employed in these industries during 1945. Now, the population is said to be about 100,000. The city had been laid out and built in a modern and orderly manner.

At present the town is almost paralyzed industrially due primarily to the Soviet removal of the power plant. All mines and industries are completely electrified. The only electric power now available is reported to be 1100 kw being brought in from Chinchow. All of the underground mines are badly flooded. Coal is being mined from the higher levels of the flooded mines, but the total production for the field is about 1500 m/tons daily as against a normal production of about 10,000.

Since the Fouhsin Coal Fields covers a rather extensive area, there is considerable variation in the quantity of the coal and the uses for this coal are correspondingly varied. The coal from the Kaoteh and the Taiping mines are coking. The following are some typical analyses:

| Locality of the Sample | Moisture % | Volatile Matter % | Fixed Carbon % | Ash % | Sulfur % | Heating Value Cal. 1 gm. |
|---|---|---|---|---|---|---|
| Haichow coal dressing plant run-of-mine | 7.51 | 28.95 | 48.00 | 15.14 | | 6,044 |
| Hsinchiu run-of-mine | 7.52 | 32.69 | 46.29 | 13.49 | | 6,111 |
| Hsinchiu lump | 9.55 | 36.32 | 49.37 | 4.76 | 0.62 | 6,380 |
| Sunchiawan " | 8.15 | 35.28 | 51.02 | 5.55 | 1.19 | 6,422 |
| Pingan " | 6.87 | 33.51 | 52.32 | 7.29 | 0.65 | 6,409 |
| Kaoteh " | 9.24 | 32.89 | 48.42 | 9.10 | 0.42 | 6,071 |
| Taiping " | 4.92 | 37.66 | 49.35 | 7.37 | 0.70 | 6,835 |

The proven reserves of the Fouhsin Coal Fields amount to 1,700,000,000 tons with a possibility of this becoming 4,000,000,000 tons. The highest annual output was for the year 1944 when 4,120,500 tons were produced. There are 38 incline shafts and 2 open-cut mines. These mines are listed below:

| Locality | Inclines | Open-cut | Remarks |
|---|---|---|---|
| Hsinchiu | 12 | 1 | 30% flooded; 8 closed by fire |
| Chengnam | 1 | 0 | 90% flooded |
| Kaoteh | 6 | 0 | 50% flooded |
| Sunchiawan | 5 | 1 | 3 inclines closed by fire |
| Peiping | 6 | 0 | 2 20% flooded; 2 50% flooded; and 2 closed by fire |
| Pingan | 4 | 0 | 2 30% flooded; 2 60% flooded |

*****

## MONTHLY PRODUCTIONS OF VARIOUS MINES FROM JAN. - JULY 1945

| Mines | Jan. | Feb. | Mar. | April | May | June | July |
|---|---|---|---|---|---|---|---|
| Hsinchiu | 70,650 | 69,150 | 77,330 | 65,480 | 66,120 | 68,930 | 71,030 |
| Kaoteh | 49,130 | 42,480 | 63,660 | 42,560 | 40,230 | 45,000 | 33,500 |
| Taiping | 79,400 | 65,460 | 78,770 | 62,520 | 65,040 | 54,550 | 56,000 |
| Sunchiawan | 89,700 | 67,460 | 107,590 | 65,450 | 61,400 | 60,100 | 66,460 |
| Pingan | 76,000 | 57,610 | 67,910 | 55,480 | 50,120 | 54,200 | 53,200 |
| Pataohao | 27,060 | 24,500 | 23,200 | 20,510 | 17,090 | 17,720 | 16,810 |
| TOTAL | 391,940 | 326,660 | 418,460 | 312,000 | 300,000 | 300,500 | 297,000 |

*****

## PRODUCTION OF VARIOUS MINES FROM 1934 to 1944
(Unit - Tons)

| | Hsinchiu | Kaoteh | Taiping | Sunchiawan | Wulung | Pigan | Pataohao | Total |
|---|---|---|---|---|---|---|---|---|
| 1934 | - | - | - | 22,056 | - | - | - | 22,056 |
| 1935 | - | - | - | 33,861 | - | - | - | 33,861 |
| 1936 | - | - | - | 74,106 | - | - | - | 74,106 |
| 1937 | 20,917 | - | 370 | 135,222 | 27,545 | - | 83,890 | 267,944 |
| 1938 | 444,283 | 54,242 | 68,690 | 207,491 | 213,021 | 55,730 | 60,110 | 1,103,567 |
| 1939 | 864,560 | 181,989 | 366,751 | 329,933 | 371,246 | 266,563 | 103,477 | 2,484,519 |
| 1940 | 1,018,640 | 354,040 | 496,700 | 554,000 | 513,000 | 439,900 | 88,750 | 3,465,030 |
| 1941 | 1,031,500 | 527,500 | 648,500 | 579,000 | 530,000 | 673,900 | 110,300 | 4,100,700 |
| 1942 | 937,380 | 427,920 | 626,020 | 683,820 | 311,280 | 801,170 | 159,700 | 3,947,290 |
| 1943 | 939,960 | 597,800 | 594,140 | 895,570 | - | 859,430 | 215,090 | 4,101,990 |
| 1944 | 958,630 | 651,610 | 879,610 | 879,410 | 1,019,160 | 759,580 | 294,140 | 5,442,140 |

******

## STAFF, WORKMEN AND EFFICIENCY BEFORE AUG. 15, 1945

| | Hsin-chiu | Kao-teh | Tai-ping | Sun-chiawan | Wulung & Pigan | Others | Total |
|---|---|---|---|---|---|---|---|
| Production/tons/day | 2,400 | 1,800 | 2,500 | 2,200 | 1,850 | - | 10,750 |
| Efficiency/tons/capacity | 0.27 | 0.39 | 0.46 | 0.39 | 0.39 | - | 0.30 |
| Staff—Chinese | 92 | 35 | 55 | 105 | 60 | 161 | 508 |
| --Japanese | 375 | 180 | 163 | 193 | 179 | 1,095 | 2,185 |
| Workmen—daymen | 1,400 | 890 | 910 | 1,020 | 910 | 2,606 | 7,736 |
| Contractors' men | 7,642 | 3,280 | 4,500 | 4,550 | 4,110 | 3,000 | 27,082 |
| Total of men | 9,509 | 4,885 | 5,628 | 5,868 | 5,259 | 6,862 | 38,011 |
| Explosive kg./ton | 350 | 400 | 270 | 380 | 270 | - | 334 |
| *Timber $M^3$/ton | 0.02 | 0.014 | 0.007 | 0.017 | - | - | 0.0145 |

*On average, 1 cu. meter holds about 30 pieces of timber.

Practically all daymen, or direct employees of the mines, were Chinese as were the contractors' men. The Japanese contracted the work in the mines as far as possible. It will be noted that less than a quarter of the staff were Chinese and they were barred from practically all important positions.

While most of the Japanese have been repatriated, key staff members are being retained until trained Chinese replacements are available. A system similar to that at Fushun has been established where the Japanese staff has been divided into three groups, one group that can be replaced by Chinese in six months, another that can be replaced in one year, and a third that can be replaced in two years. It was reported that all the Japanese wanted to go home but that those remaining were working industriously and with good cooperation.

Two former Japanese officials of these mines were with us on all our inspection trips, ate all their meals with us, and were apparently accepted as social equals by the Chinese. One of these men was the former manager. They were very polite but reticent. However, they answered questions readily and willingly. The servants at the club at which we stayed were all Japanese. The members of the Chinese staff impressed me as being capable and energetic. Most of them had received engineering training in America.

The following is quoted from notes furnished concerning the geology of the Fouhsin Coal Field:

> "The coal field lies between two ranges of hills in a northeasterly and southwesternly direction. The coal bearing strata are Jurassic in age. The northwestern hills are prophyrite and tuff. The southeastern hills are gneiss and granite. The basic formation of this coal field is irregular gneiss and Fouhsin series. The bottom Fouhsin series comprises andesite and volcanic rocks. There are conglomerate breccia, fish fossils, shale, and coal seams containing shell fossils. The top layer contains four thin coal seams. The coal of Fouhsin series is oil bearing. When the seams are irregular, there will be conglomerate and sandstone of deep brown color exposed. The basic formation of Sunchiawan strata contains conglomerate of big size. The general strike is northeast and southwest.
>
> "The seams of Fouhsin territory are mostly northeast and southeast with certain variations. They have a gentle dip of 10°--20° to the south. The seams of Hsinchiu territory are two in number, with a varying thickness of 5 - 20 meters. There are several seams at Kaoteh with a varying thickness of 2 - 5 meters, total thickness being 20 meters. There are 4 seams at Taiping and Sunchiawan, the thickness of which being 30 meters and total thickness being more than 100 meters. At Pingan there are 2 seams of a thickness of over 15 meters.
>
> "There are 3 principal coal dressing plants having Baum and Rheolavenr coal picking machines, 1 at Haichow, 1 at Pingan and the other at Hsinchiu."

Time did not permit visiting all installations at Fouhsin. The following are our observations on those inspected.

## FOUHSIN POWER PLANT

This plant was reported to be equipped with two 27,000 kw turbo generators and two 53,000 kw turbo generators and 8 B & W boilers. This plant was stripped completely except for one standby switch panel, which doubtless had been left together with sufficient trimmings to make power available for removal operations, the power being brought in from Chinchow as at present.

The debris around the plant indicated that the stripping of the plant had been extremely disorderly and undisciplined. The size and types of the materials involved refutes the contention that the chaos was the result of Chinese looting. There was an abundance of evidence of unnecessary destruction of remaining structures and equipment. Two large circular cast iron castings, parts of either the turbines or the condensors, were left beside the railroad track in the power house and 2 were left in a gondola on a side track in the yard. It was reported that these parts were left because they were too large to pass through some tunnel or underpass when loaded on a car. The manner in which the shells were loaded reflected ignorance of how such equipment should be handled and together with other evidence of clumsy handling of machinery raises the question as to the probable effective use this equipment will have by the time it reaches its destination. I would estimate that 25 percent is a high figure. Ten percent is probably more nearly correct. For further information about this power plant see Plant Inspection Report 22-L-1 in Appendix 3.

## FOUHSIN MINING MACHINERY FACTORY

This plant was built in 1937 in connection with the development of the Fouhsin mines. It consists of a machine shop, steel, iron and alloy foundries, pattern shop, forge, structural, welding, and wood working and automotive repair shops. This plant is capable of manufacturing, on a small scale, moderate sized equipment for the coal mines. This plant is now operating at reduced capacity.

There was ample evidence of large scale removal of machine tools and other plant equipment. In the machine shop the present foreman and his Japanese predecessor reported that 29 of the best machine tools out of a total of 74 had been removed with electric motors and drives. They also reported that the best gauges, tools, and instruments were also removed. Nearly all of the woodworking tools in the pattern shop had been removed. Two out of three of the small steam hammers in the forge shop had been removed. Twelve electric welders were reported as removed. The air compressors had been removed. The control panel in the compressor room had not been removed but guage glasses had been broken and guages damaged. A chalked sign in Russian on this panel was interpreted for me as saying "anyone who can do the work, do it."

It was reported that the chief engineer of this plant, although Japanese, turned out to be a Communist. He cooperated enthusiastically with the Soviets and left for the U.S.S.R. when the equipment was removed. Three other designers and engineers were reported as taken away by the Soviets from this plant.

## HAICHOW COAL DRESSING PLANT

The principal loss here was a conveyor belt about 4 feet wide, 8 ply and 3,000 meters long. The plant was equipped with eight Baum and Rheolaveur coal picking machines but the belts had been removed from all but one of them. Considerable electrical equipment was reported as moved from the main switch panel. The balance of this panel as well as most of the wiring had been destroyed by fire. It was reported that this fire started shortly after the Soviets had completed their removals and that they refused to allow anyone into the building while the fire was burning. One coal picking machine is now in operation and it was reported as handling 1,000 tons per day.

## SUNCHIAWAN OPEN PIT

This pit is reported to have produced a total of about 5,000,000 m/tons of coal to-date. It is being mined by the multiple bench system. The pit is about 1,700 meters long by 500 meters wide by 65 meters deep. The seam is about 30 meters thick and dips about 15 degrees to the south. The removal ratio is about 4:1. It is reported that the Soviets removed three of the four power shovels and removed the motor from the fourth. Nearly all standard guage gondolas were removed by the Soviets who used them for hauling equipment away. These cars may show up in northern Manchuria. Looters have removed the roller bearings from nearly all narrow guage cars. These bearings will probably show up on peasant carts and wagons. The Soviets took one of the winding engines.

The remaining power shovel has been repaired and this pit is being operated with available equipment which necessarily makes it a crude operation. It is reported that 2,000,000 m/tons of coal were in sight in this mine.

## REPAIR SHOW

This shop is nearly a complete wreck. The Soviets removed all major tools and motors. The place has been badly stripped, even to the roof.

## TAIPING HOSPITAL

Completely stripped. It is one of the two principal hospitals and now gives the appearance of having been thoroughly looted. The statements of the Japanese doctor in charge supports the statements of Chinese authorities that the hospital was thoroughly stripped by the Soviets and looters played a minor part. Viewed in the light of the indisputable evidence at the power house, I believe that the statements by the Japanese doctor and the Chinese officials are confirmed.

Interview with Japanese Doctor:

Q: Were you in charge of the Taiping Hospital when the Soviets arrived?

A: Yes

Q: Did the Soviets take over the hospital?

A: Yes

Q: For how long?

A: About one month, from the end of October to the end of November.

Q: Did the Soviets remove any hospital equipment?

A: Yes, vital parts of the X-ray machine, the microscopes, sterilizers, laboratory equipment, the drugs, and most of the other hospital supplies.

Q: Were there any looters?

A: Not until the Soviets left.

Q: What did they take?

A: Not very much because the Soviets left very little.

Q: Were there any looters during the time between the departure of the Japanese troops and the arrival of the Soviets?

A: No.

Q: Did the Soviets leave any X-ray machines, laboratory equipment, or drugs in Fouhsin when they left?

A: No.

Q: Is there any X-ray machine in this community now?

A: The Nationalist Army has one but it is badly in need of repair.

Q: If I broke my leg today, could I have it X-rayed in Fouhsin?

A: No.

Q: If I had appendicitis today, could you operate?

A: Yes, at the Nationalist Army hospital.

Q: How long has the civilian population been without hospital facilities?

A: Ever since the Soviets arrived. After they took over the hospitals they would not allow anyone in them except their own people.

Q: How did the Soviets treat you?

A: They treated me well.

Q: What did you do after the Soviets left?

A: Shortly after the Soviets left the Chinese Communist Army took me with them but I got away.

Q: What are you doing now?

A: I am taking care of the mining people and am helping at the Chinese Nationalist hospital.

Q: Did the Soviets take any Japanese doctors or medical technicians with them when they left?

A: No.

Q: Have there been any serious epidemics since the Soviets arrived?

A: No.

Q: How many Soviets were in the hospital?

A: About 100.

Q: What was the matter with them?

A: A normal variety of diseases and accidents.

- - - - - - - - -

The flooding of the Fouhsin mines as a result of the destruction of the source of electric power was a tremendous economic waste. Unwatering these mines will undoubtedly be accompanied by considerable caving and will complicate future operations. Damage to the mines from flooding and fires probably exceeds the cost of equipment removed by the Soviets.

Estimates of the present Chinese authorities are that a total of 51,572 m/tons of equipment and material were removed or irreparably damaged as a result of Soviet occupation. A spot check of a number of items on this estimate indicated that the estimate was essentially correct.

There is ample evidence of wholesale looting by local Chinese, particularly in the Japanese section of town. The manner in which the power plant was dismantled tends to indicate that Chinese looting was of minor consequence to the industrial plants by comparison with the effects of the Soviet action. The size and character of the mateials involved in the stripping of the power plant indicate that looting was not the cause of wreckage. The best that can be said for the dismantling of the power house is that it appeared to have been done in great haste by inexperienced and undisciplined persons with ample power at their command. The following are a few of the items taken from a list prepared by Chinese government officials and do not include the power plant equipment (this equipment was reported as removed during September, October, and early November 1945): Details will be found in Source File 202-B-1.

| | | |
|---|---|---|
| 41 | Air compressors, 30 - 300 H.P. | |
| 4 | Ventilating fans, 100 H.P. or over | |
| 37 | Hoisting engines, 50 H.P. or over | |
| 359 | 1-1/2 ton mine cars | |
| 992 | 1 ton mine cars | |
| 5,057 | Small wooden frame mine cars for underground | |
| 1,061 | Small timber cars | |
| 120 | 35 yard dump cars | |
| 822 | 1 ton dump cars | |
| 3 | Locomotives, standard guage, American type | (probably used |
| 12 | " " " Japanese " | (for hauling |
| 231 | Coal and box cars | (equipment away |
| | | (and may show up |
| | | (someday along |
| | | (the railway |
| 1,540 | Meters of standard RR rail, 69 tons | |
| 33,046 | " " mine rail, 496 tons | |
| 115 | Metal lathes | |
| 4 | Air compressors, 30-150 H.P. | |
| 296 | Pumps, 5-250 H.P., mostly flooded in mines | |
| 474 | Transformers, 3 KVA to 50 KVA | |
| 3,674 | Cubic meters of lumber | |
| 898 | " " " mine timbers (on an average 30 mine timbers make 1 cubic meter) | |

We heard stories of looting from many sources during our stay at Fouhsin and they all seemed to follow a consistent pattern and were very similar to the many stories we heard in Mukden.

At Fouhsin I received no reports of any Chinese looting until after the arrival of Soviet troops. Japanese troops pulled out ahead of the Soviets, and the population remained orderly until the arrival of the Soviets. It was reported the pattern for pillage in Fouhsin apparently was as follows: The Japanese were given 2 hours to move out of their homes and into another area of town. A short time later they were again given a sudden move. Apparently the principal objective of these quick moves was to make it necessary for the Japanese to carry their most prized possessions on their persons. Shortly after the second move it was reported that the Soviet soldiers started wholesale raping and pillaging. Their first demands were reported as being women. Then followed the plundering of persons and premises. This in turn was followed by looting by the Chinese with the hearty encouragement of Soviet soldiers. I heard of no reports of Chinese looting of industrial property until after the Soviets had completed their removal of equipment and supplies.

As at Mukden and Fushun there were numerous reports of Chinese mobs being excited to loot by Soviets in uniform. Mr. Lay offered the opinion that the Soviets' motives for such action were:

1. Temporarily to appease the people for the Soviet removal of equipment.
2. To cover, as far as possible, the evidence of equipment removed.
3. To confuse the issue as much as possible.

Mr. Lay reported that on his visit to Fouhsin in March that there still was not a single vehicle of any kind on the streets as anyone owning such equipment had it well hidden.

Another report that we frequently heard was that during the stripping of industrial plants that the Soviets paid the workers largely with supplies from the plant's stores, although there were reports of the use of Soviet military currency for laborer's wages.

It was reported that in stripping the power plant that the work was conducted in two 12-hour shifts per day. Evidences of frantic haste on this job are abundant.

Fouhsin had two main hospitals, the largest of which was known as the Central Hospital and would be rated at about 200 beds although actually it had about twice that number. The other major hospital was known as the Taiping Hospital, which would be rated at about 150 beds but this also frequently accommodated twice this many it was reported. In addition there were about six dispensaries with wards for the treatment of minor ailments—roughly one for each mine. All except the

Central Hospital were reported stripped completely and much vital equipment such as the X-ray tubes, microscopes, drugs, etc., were taken from the Central Hospital. This hospital is now being used by the Nationalist Army which had moved in a considerable amount of their field medical equipment.

Apparently when the Soviets left, a modern city of about 200,000 people had been stripped of food, medical facilities and all means of transportation. Law and order had been completely broken down and the means of livlihood for the people destroyed or paralyzed.

PREPARED BY

Norman Cleaveland

## MEMORANDUM

While at Fouhsin it was learned that in late March of this year, J. H. Pierce, J. W. Woomer, L. Eaton and M. F. G. Koper, engineers of the firm of Pierce Management had spent several days inspecting the Fouhsin mines. This firm has an outstanding international reputation in the coal mining industry. Upon returning to Washington Mr. Pierce was furnished with copies of the reports on the Fouhsin and Peipiao mines for comment. A photostatic copy of his reply is attached.

It will be noted that he places the value and volume of removals at twice the amount shown in our report. This descrepancy can be explained largely by the fact that our figures do not include power plant removals or removals of pillage from the city. If these items were added to our figures, it is believed that the Pauley Mission estimates would agree fairly well, although the figures may still be on the conservative side.

PREPARED BY

Norman Cleaveland

PIERCE MANAGEMENT

ENGINEERING CONSULTANTS AND MINE MANAGERS
ANTHRACITE – COAL – BITUMINOUS
SCRANTON ELECTRIC BUILDING
SCRANTON, PENNSYLVANIA

August 15, 1946

Mr. Norman Cleaveland
c/o Pauley Reparations Mission
The White House
Washington, D. C.

Dear Mr. Cleaveland:

I have read over with much interest your report on the Peipiao and Fuhsin Mines. I find them very informative and factually correct, and can add very little to this excellent presentation.

For your information, at Peipiao we specified $1,179,542 for quick rehabilitation of the property, and at Fuhsin $5,552,624.

We did not attempt to measure machinery damage nor the value of equipment taken as our objective was the securance of such material, supplies and equipment as would most quickly establish a reasonable production.

I note on Page 10 that the estimates are a total of 51,572 metric tons of equipment removed or damaged by the Soviet.

The information that we received from the Fuhsin officials and local Japanese technicians was that the Russians had removed 2,200 railroad cars of equipment from the village mine plant and power plant. Based upon sixty tons per car, this would represent 132,000 tons of material, and at $500 per ton would represent $66,000,000 worth of damage.

There is a one hundred percent discrepancy between the figure you used and the information we secured.

Yours very truly,

PIERCE MANAGEMENT,

By: James H Pierce

JHP:JHL

# PEIPIAO COAL MINES

**Location:** Chaoyang District, Jehol Province.

**Date Visited:** 9 June 1946, by Norman Cleaveland and Carleton B. Swift, Jr.

We arrived at the Peipiao Mines by train from Fouhsin at about noon. We were cordially welcomed by Mr. Wu, the mine manager, and his staff which included several Japanese. During the afternoon we visited various mine installations and left by train on the following morning at about 9 A. M.

These mines are important because they produce a high grade coking coal. The mines were developed by British capital and were taken over by the Japanese in a forced sale when Manchuria came under Jap rule in 1931.

While it was reported that the Soviets removed large quantities of supplies and clothing they did not take much in the way of machinery. They even left the main power plant intact. This power plant was later damaged by the Chinese Communist Army during its attack on the mine on May 15, 1946. The transformer station was also destroyed during this attack. These actions resulted in severe flooding of the mines with the attendant loss of pumps and other vital mine equipment. Unwatering of these mines will be an expensive operation and will handicap future development of them. During their attack of May 15th it was reported that the Communists also conducted large scale looting and malicious destruction of property. It is reported that they took everything they could lay their hands on that was made of cloth or anything similar to cloth. It was reported that at this same time all of the mining, engineering and office records of the mine were destroyed. They blew up a railroad bridge that connected one mine to the central plant. During this attack the mining staff barricaded themselves in a section of the property and held off the Communists until armed relief appeared 35 hours later.

Fortunately, the damage to the power station can be repaired, a job that is expected to be completed in about a month from now. For further information about the power plant kindly refer to Carleton B. Swift's Report 22-L-1.

The hospital has been thoroughly looted and the mine is without adequate medical facilities at present. It was reported that the Soviets removed certain vital hospital installations such as the X-ray tubes, microscopes, and valuable drugs but the balance of the damage was done by looters.

The Japanese living quarters have been looted almost to complete destruction. Well built, modern bungalows have had their floors, ceilings, and walls torn out, probably in the search for hidden Japanese valuables.

It was reported that at the time peace was declared that the Japs had sufficient stores and supplies to operate the mines for eight years.

The train of events as reported to us was substantially as follows: Upon learning of the Japanese surrender, the Japanese officers in the police force turned their arms over to their Chinese underlings. These Chinese had been trained by the Japanese and the police force functioned in a normal manner. General conditions at the mine remained stable and orderly for over two weeks until the Soviet troops arrived. The Soviets promptly subjected the Japanese to the same pattern of rape and pillage as reported at Fouhsin with active encouragement to the local Chinese to take over where they (the Soviets) left off. The Soviets took away large stores of clothing, foodstuffs and general supplies. Chaotic conditions prevailed for some time after the Soviet departure but the mine got back into fairly good running order before the Chinese Communist Army subjected the mine to another spell of looting and destruction on May 15th.

At present the mine is an armed camp, ringed by block houses and there are over 1000 Nationalist troops quartered there.

A 1000 KVA steam generator at one of the oldest mines is in operation. This supplies sufficient power to carry on mining operations, after a fashion, from two inclines and two shafts. Two hundred and fifty tons of coal per day were reported as being produced at the present time. This is just enough to keep the mines going. One hundred tons per day is set aside for the workmen, as partial wages, and the other 150 tons goes to the power plant and railroad.

When the main power plant becomes operative it will be a substantial step towards getting the mines back into normal operation. These mines normally turn out about 3000 tons of coal per day. However, these mines can never be economically operated if it is necessary to maintain them as an armed camp. (This mine was attacked again on June 13th, three days after we left, by the Chinese Communists and it was reported that they blew up the hoist, transformer and other installations at one of the mines. Also, several railroad bridges were destroyed and the mine isolated.)

The Japanese paid the laborers mostly in food and clothing. It is reported that when the Soviets arrived they announced an increase in wages and ration allowances; however, when the mine supplies became exhausted the pay stopped altogether and the workers went unpaid for the last month under Soviet management.

Key members of the Japanese staff are being retained at the mine pending the training of suitable Chinese replacements. The Japs are all anxious to go home, however, Mr. Wu stated that they worked very hard for him and cooperated fully. Members of the Japanese staff attended all meals with us. They were quiet and reserved. Some of the servants were Japanese and I was told that our waitresses were daughters of former mine directors.

As at Fouhsin, it was reported that J. H. Pierce, J. W. Woomer, L. Eaton, and M. F. G. Koper had spent several days inspecting this mine in connection with some negotiations between the Chinese and American Governments. (See Plant Inspection Report 21-B-1).

In going over the itemized list of damages claimed by the mine as the result of Soviet occupation, I found several exaggerations in value based on prices in the United States. However, if the items listed were to be replaced at the present time at the Peipiao Mines, the cost might well be greater than the values shown. Damages were totaled as follows:

| | |
|---|---|
| Machinery | $ 159,390.00 |
| Stores | 377,268.75 |
| Living Necessities | 1,162,474.25 |
| Coal and Coke | 609,545.00 |
| Buildings | 1,001,441.00 |
| Cash | 2,583.00 |
| Others | 2,533,677.45 |
| | $5,846,379.45 |

The damages listed as suffered from the Chinese Communist Army attack of May 15th, totaled $823,862.37.

I have taken a figure of $5,000,000.00 to represent the damages resulting from Soviet occupation.

While it was claimed that all mine records were destroyed by the Chinese Communists in their attack of May 15th, Mr. Wu was able to provide some technical information which had been kept in the personal possession of a Japanese member of the staff. These documents are copied below with no alteration to spelling or grammar.

## GENERAL CONDITION OF PEIPIAO COAL MINES

March, 1946

### Location and Communication:

Peipiao coal mines are located at Peipiao in Chaoyang district of Jehol Province. They are connected with Peiping-Liaoning (Pekin-Mukden)

R. R. by a branch line of Chinhsien-Kupeikou R. R. from Chinlingssu. It is 4 hours by train from Chinhsien to the mines. The railroad from Chinhsien to Peipiao runs along the Taling River. The distance from Peipiao to some important cities is as follows:

| To | Distance in KMs. |
|---|---|
| Chinhsien | 112.6 |
| Hulutao | 174.7 |
| Yinkow, north | 267.6 |
| Shanhaikuan | 296.1 |
| Mukden | 348.8 |
| Tungliao | 470.2 |

Hulutao is the nearest port.

## Geology

Peipiao coal field is of the Jurassic period of Mesozoic era, extending in the form of a bow from southwest to southeast for 20 kms. Its width varies, but averages 1.5 kms. At its bottom are limestone and silica formations. The lower part of coal bearing strata contains sandstone; the lowest part, conglomerate and volcanic rocks of Fuhsing series. The upper part dips irregularly towards the lower. The coal bearing strata northwest from northeast to southwest. Coal is mined at present in the upper part of Peipiao series.

## Seams, Reserve and Output

1. There are 9 seams, 8 of which are being mined. The thickness of working seams and their intervening distance are as follows:

| Seam (Number) | Thickness (Feet) | Intervening Space (Feet) |
|---|---|---|
| 3 | 6-8 | 69 |
| 4 | 3-8 | 69 |
| 4-1/2 | 3-5 | 69 |
| 5-A | 5 | 33 |
| 5-B | 4 | 18 |
| 6 | 3-7 | 12 |
| 7 | 4 | 60 |
| 9 | 6 | 96 |

The general strike of the seams is northeast and southwest, dipping 35-70° to northwest, generally 40°. There are no partings in Nos. 4 and 5 seams, but Nos. 3, 6 and 9 may contain from 1 to 5 partings each.

There is a thick layer of surface soil, which precludes a view of the underlying rocks. Orderly old pits may be seen scattered in the region.

2. The reserve of Peipiao mines is:

| | |
|---|---|
| Estimated | 203,000,000 tons |
| Ascertained | 200,000,000 tons |

3. The output of the mines in 1944 is: 1,238,000 tons.

The Nature of Coal:

Peipiao coal is strongly coking, No. 5 seam in particular makes very good coke containing little sulphur and phosphorus. It burns easily and is good household fuel. The low phosphorus coal mined can be used for iron smelting and coke making. The following are some typical analyses:

A

ANALYSES MADE BY FUSHUN COLLIERY

| Seam | Moisture % | Volatile matter % | Fixed carbon % | Ash % | Sulphur % | Heating value Cal./gm | Caking quality |
|---|---|---|---|---|---|---|---|
| 3 | 1.38 | 35.74 | 51.00 | 11.88 | 0.37 | 7,093 | readily |
| 4 | 0.80 | 39.34 | 47.48 | 12.38 | 0.33 | 7,004 | " |
| 4-1/2 | 0.96 | 36.44 | 55.00 | 7.50 | 0.62 | 7,519 | " |
| 5-A | 1.34 | 27.86 | 61.84 | 8.96 | 0.56 | 7,430 | " |
| 6 | 1.14 | 39.86 | 48.40 | 10.60 | 0.75 | 7,406 | " |

B

ANALYSES MADE BY MANCHURIA COAL MINING CO., LTD.

| Mine | Moisture % | Volatile matter % | Fixed carbon % | Ash % | Sulphur % | Heating value Cal./gm | Caking quality |
|---|---|---|---|---|---|---|---|
| Kuanshan | 1.42 | 33.64 | 51.82 | 13.12 | 0.25 | 7,120 | coking |
| Sanpao | 0.71 | 32.25 | 56.69 | 10.35 | 0.28 | 7,751 | " |
| Taichi | 2.20 | 36.94 | 48.39 | 12.48 | 0.28 | 6,827 | " |

## ANALYSES FOR AVERAGE SAMPLES IN MAY, 1941

| Mine & Grade | Moisture % | Volatile matter % | Fixed carbon % | Ash % | Color of Ash | Caking Quality |
|---|---|---|---|---|---|---|
| Kuanshan, special washed slack | 1.09 | 35.94 | 49.08 | 13.89 | weak tea | strongly |
| Kuanshan, lump | 1.50 | 31.12 | 41.18 | 26.20 | " " | coking |
| Kuanshan, washed slack | 1.36 | 27.85 | 34.52 | 36.27 | " " | " |
| Taichi, special washed slack | 1.34 | 27.62 | 51.33 | 9.71 | " " | strongly |
| Taichi, washed slack | 1.20 | 33.58 | 44.85 | 20.37 | " " | coking |
| Sanpao, lump | 0.84 | 29.50 | 46.20 | 23.46 | light gray | strongly |
| Sanpao | 0.75 | 23.43 | 42.23 | 33.59 | " " | " |

Mining:

Coal is mined at Kuanshan, Sanpao and Taichi. There was mining at Kuanshan in early days.

1. Kuanshan Mine. There are 2 shafts and 2 inclines. The 2 shafts are 164 feet apart, and were designed by Mr. Moller, a British engineer.

| Shaft Shape | Diameter | Depth | Headframe height | Motive power | Rope Diam. | Cage capacity |
|---|---|---|---|---|---|---|
| No. 1 Round | 15 ft. | 900 ft. | 45 ft. | Electric | 1-1/2 in. | 2 cars |
| No. 2 Round | 15 ft. | 600 ft. | 45 ft. | " | 1-1/2 in. | 2 cars |

Both shafts were built of concrete. No. 1 shaft was completed in 1924 and is used as upcast. No. 2 shaft was completed in 1922 and is used as inlet. The hoist engines at both shafts are 500 H. P. The hoist engine at No. 1 shaft takes 30 seconds per trip and has a capacity for 1,800 tons per 24 hours. Its drum diameter is 12 feet. No. 2 shaft is for lowering materials and inlet and exit of men.

The seams above the level of shaft bottom have been exhausted. The bottom of No. 1 shaft is about 500 meters along the east and west line. The slope underground is 20°.

There are 300 H.P. hoists at the mouths of the 2 inclines. At present production is centered at the inclines. Levels are 50 meters apart. Long wall method is employed for easier advance and mining. The coal dips 40-60°, so there is no need of face conveyors. The main haulage ways, 8' x 10' in section, are provided with double track of 25-30 lb. rails, 2' gauge; other haulage ways are 6' x 6' and provided with single track of 16 lb. rails. There is a 150-meter crosscut to connect the main haulage ways.

2. Taichi Mine. There are 3 inclines at Taichi Mine. No. 1 incline is driven in rock at a slope of 15° and provided with a belt conveyor of 610 mm. width for 200 tons per hour and a 300 H.P. electric hoist. The mining method is adapted for primarily the 4-meter seam. The lower 2-meter portion is completely packed with filling, while the upper half is packed in the belt form. The face is 50 meters long with 40° slope for gravity conveyance.

No. 2 incline has a steep slope of about 50°, which is generally used for metal mines. A cage with chute for unloading is used.

The mined coal is transported on surface to coal washeries.

3. Sanpao Mine. Owing to the existence of volcanic rocks and variation of seam, 4 inclines were driven along each km. At present coal is produced from only 2 inclines. Methodical mining has its difficulties. Levels are driven 50 meters apart. Long wall method is used here as at the other 2 mines.

Tools used in mining are:

a. Jack hammer
b. Coal pick
c. Electric augur

4. Transportation: At all the 3 mines, chutes and iron troughs are utilized for coal transportation at the faces wherever permitted by slope.

In the lower levels of Kuanshan mine, hand operated endless is utilized. In the inclines, coal is transported along main haulage ways and then hauled by electric trolley to shaft bottom for hoisting to surface.

At Sanpao mine, endless, horses and hand operated endless are used for transportation to surface. The Coal is then sent to Kuanshan by special railway.

In the levels of Taichi mine, endless and hand operated tipple are used. At No. 1 incline the belt conveyor takes the coal to surface. At No. 2 incline, coal is hoisted to surface and hauled to No. 1 incline by electric trolley.

5. Electric Trolley and Coal Cars: There are 3 each of 3-ton battery locomotives and 6-ton electric trolleys. The coal cars are all iron made of a capacity of 0.65 ton for Kuanshan, 0.75 ton for Sanpao and 1 ton for Taichi.

6. Coal Dressing: As Peipiao coal is mainly for iron manufacture, it is washed. The Baum picking table at Kuanshan has a capacity of 800 tons per hour, at Taichi, 60 tons; and at Sanpao 40 tons.

7. Machinery:

a. Hoists - 2 at the shafts and 52 at the inclines and levels with a total of 5,860 H.P.

b. Compressors - 35 of a total of 4,025 H.P.

c. Pumps - 4 of 300 H.P.
13 of 100-300 H.P.
35 of below 100 H.P. totalling 5,300 H.P.

d. Fans - 4 of 300 H.P.
3 of 100-300 H.P.
1 of 100 H.P. totalling 2,225 H.P.

In addition there are local fans of Japanese make, turbo fans at Kuanshan mine, sirroco fans at Sanpao and turbo fans at Taichi.

8. Lamps: The lamps used underground are cap electric safety lamps of Japanese make.

9. Safety: The workings of Taichi and Sanpao mines are near surface, there is no sign of the presence of coal gas. The dip of coal increases below 170 meters. The workings of Kuanshan mine are about 400 meters below surface and show increase of coal gas. Consequently, main fans are used for the mines with local fans for different localities, to decrease the quantity of coal gas. When air lines are extended and there is stoppage of current, the quantity of coal gas increases abruptly. As soon as explosive gas is found, safety rules are enforced.

The coal dust of the mines contains much moisture, hence it is not considered dangerous. When the dust of any working face becomes dry, and there may be dangerous dust, a water pump is made in the vicinity and water is then led from it with iron pipes for drizzling.

PREPARED BY

Norman Cleaveland

## SUPPLEMENT TO REPORT 22-B-1

While in Harbin, I asked one of the Communist Generals what the Communists' motive was in their destructive attacks on the Peipaio mines. He said he had never heard of these attacks and was interested in learning about them from me. He said that he was unable to explain why these attacks were being made; that as far as he knew, it certainly was not the policy of the Chinese Communist Party to destroy Chinese natural resources. He said that there was very little contact between the Chinese Communist forces in the Peipaio area and other elements of the Communist Army and he credited these attacks purely to irresponsibility on the part of the local Communist commanders.

Norman Cleaveland

This document was prepared by Chinese and Japanese and is copied in their original English.

## THE OUTLINE OF PEIPYO COLLIERIES COMPANY

February 35 Year of Mingo (Minkuo or Chinese Republic) (1946)

(1) The history of Peipyo coal mine:

The origin of this mine is not clear, but it seems to have been digged by the natives with most primitive manner from the Ching period. (1644-1912).

In 10 year of Mingo (1921), Peipyo coal mining limited company was built and soon it began to work in the regular way. But the company was forced to stop its business by that 9. 18. troubles occurred in 20 year. (1931)

Then in March 22 year (1933), the industrial Department of Manchuria government had succeeded the business of the mine, and in December of same year, another Peipyo coal mining limited company was built with the capital of Japan & Manchuria.

In April 26 year (1937), it was incorporated by Manchuria Collieries Company and on 1st March 32 year (1943), present Peipyo Collieries Company (joint stock company) was established by the dissection of Manchuria Collieries Company and it had been continuing its business up to this day.

(2) The establishment of this company:

On the establishment of the company, on 15th of February 32 year of Mingo (1943), Mr. T. Takasaki the precident director of Manchuria heavy industrial company was selected as a representative of the projectors, and he decided the articles of association of the company having been supported by whole projectors on same day, then the company began its business on 1st March.

(a) The capital-

The authorized capital of the company is 60,000,000 Y (1,200,000 shares, 50 Y per share), and the capital paid is about 50,000,000 Y at present.

(b) The shareholders-

1,199,800 shares - Manchuria iron manufacturing company (Anshan)

100 shares - K. Tanaka (a director of the same company).

100 shares - H. Tanaka (one of the staffs of the same company).

NOTICE. - At the beginning of this company the whole shares belong to Manchuria heavy industrial company, but they were transferred to Manchuria iron manufacturing company in April 34 year of Mingo, (1945).

(3) The organization in the company:

The organization in the company at present is as follows:

- Head Office
  - General affairs section
  - Accounts do
  - Purchasing do
  - Livelihood do
  - Agriculture and cattle breeding do
  - Labour do
- Hospital
  - Mining Section
  - Traffic do
  - Engineering do
  - Construction do
- Mines
  - Kansan Mine
  - Saupo do
  - Taichii do
- Despached Offices
  - Shingking do (Changchun at present)
  - Mukden do
  - Chingshen do (this belongs to the general affairs section)

(4) The employees:

The number of employees, the members & the labourers, of the company at the end of June last year were as follows.

(a) The members (Chinese & Japanese) - 1,283

(b) The labourers (all Chinese) - 14,660

(5) The Organs for the employee's welfare:

(a) Hospital -

We have a central hospital at Nansan & three branches, one at each mine.

The central hospital has such departments as Medicine, Surgery, Otorhinolaryngology, Dermatology, Ophthalmology, Obstetrics, Dentistry and Lentgen.

The medical instruments of these hospitals were prepared almost completely, the doctors were good arranged, and the medicines were also prepared abundantly. But unfortunately almost all these instruments and these medicines were carried away by Paro troops, (Palu or Eighth Route ie Chinese Communists), so that the hospitals cannot continue their business perfectly at present.

(b) The Dwellings for the employees -

The dwellings for the employees with water, electricity and hearth, are also provided and the numbers of those are as follows.

(1) For the members -

| | | |
|---|---|---|
| Nansan | 260 | (besides this, the dormitory 3) |
| Kansan | 70 | ( do 1) |
| Saupo | 85 | ( do 1) |
| Taichii | 105 | ( do 1) |
| TOTAL | 520 | ( do 6) |

(2) For the labourers -

| | For familymen | For singles |
|---|---|---|
| Kansan | 2,966 | 2,830 |
| Saupo | 1,746 | 2,000 |
| Taichii | 3,380 | 3,825 |
| TOTAL | 8,092 | 8,655 |

NOTICE. - Besides those above mentioned, we had 1,194 dwellings for the familymen which had been under construction at Kansan last year.

(c) The mission of the livelihood section -

In order to obtain the stavility of living of the employees, the livelihood section had always been making its best to supply the necessities of life to them with cheap prices as possible. So that the section prepares many stores in each dwelling quarters at Nansan, Kansan, Saupo and Taichii. But to our great regret almost all stocks of the necessities of life say about 4,000,000 Y were carried away by Russian troops, and the bad natives or Paro troops.

(d) The agriculture and cattle breeding section -

In order to promote the efficiency of the employees in their business, the agriculture and cattle breeding section makes its best in giving them sufficiently a nutriment as those corns, vegetables, meats, fishes, etc.

So that the section has been managing its own farms hither and thither in this district, pastures in Peipyo and fishery in the bay of Korotan. But among of them, the farms and fishery will be left just as they are on the contrary cattles as those cows, pigs, hens, etc., were plundered away by Russian troops.

(6) The mine concerns:

(a) The coal field -

The coal field, Kansan mine situating at its center, extends about 24 km long in the stripewides (from east to west), and about 6 km long in the dip wides (from south to north), and the whole area of the field occupies about 23,870 square meters.

The dip of the coal seam shows a steep slope of about 45° on the average.

There are 8 workable coal seam in the centre district of the field, sickness of which are from 0.8 meters to 5 meters, and there are 2 or 3 seams in side districted of the field.

(b) The amount of the sitting coal -

The amount of the sitting coal is presumed as about 170,000,000 tons.

(c) The quality of the coal -

The coal of this mine is good bituminous coal and it has a strong coking power, moreover its phosphorus contents is extremely low, so that it is most suitable for the iron-producing coke.

(d) The situation of 3 mines -

(1) Kansan

The opening of this mine began at 10 year of Mingo and its coal production continues since then.

The deepest part of the mine at present reaches about 450 meters vertically below the surface of the ground. And the condition of the coal seams is good but the getting coal in this mine will be difficult gradually according to its increasing deepness.

(2) Saupo

The mine was opened in 26 year of Mingo, and the deepest part of it reaches about 280 m under the surface now. So that the depth is not so sever, but the situation of the coal seams is not good.

(3) Taichii

The time of the opening and the present depth of this pit is almost similar to that of Saupo, but the lying condition of the seam on the contrary is good. But the layer slope is so steep that it is very difficult to pack the goat.

(4) The gas and the water

The amount of the gas and coal dust will increase in accordance with the promotion of the depth and the working in the pit will become troublesome gradually.

The quantity of the underground water increases not so much for the recent several years, and the annual average amount of the water pumped out is about $14\ m^3$ per minute.

(e) The washing plants -

As the coal of this mine has a special quality suitable for manufacturing iron as above mentioned, in order to increase an effect of this good quality we have 3 Baum type washing plants at each mine.

The total capacity of all plants in a year is about 1,250,000 tons, but adding to them in order to prepare with more products and to decrease the ash content - more over we had a plan to enlarge the plant at Taichii mine and it has been under construction.

The relation between an annual out puts planed and the capacity of the plants is as follows -

(1) Out puts planed -

| | | |
|---|---|---|
| Kansan | 700,000 | tons |
| Sanpo | 200,000 | do |
| Taichii | 600,000 | do |
| TOTAL - | 1,500,000 | do |

(2) Capacity of the Equipments -

| | | | |
|---|---|---|---|
| Kansan | 450,000 | tons | (existing) |
| Sanpo | 200,000 | do | ( " ) |
| Taichii | 600,000 | do | ( " ) |
| do | 350,000 | do | (under construction) |
| TOTAL | 1,600,000 | do | |

As to the ash percentage -

The ash-percentage of the raw coal varies from 23 to 38 and the ash-percentage of washed coal required by the government last year was

15 percent in Kansan and Sanpo coal, and 10 percent in Taichii coal, and 12.85 percent on the average in all.

An actual result of the washing, last year, was 11.89 percent on the average.

(f) The transaction -

In order to convey the product or other various kind of goods, we have a heavy weight railway of 4,000 m between Rohtoinze and Taichii and of 15,000 m between Taichii and Sanpo through Kansan, and had 12 steam locomotives. These locomotives also had been carried away to Chingshen by Russian troops but as it is said that these are left just as they are. They may be brought back here some day.

(g) The electric power -

The electric power is supplied by Manchuria electricity company.

The receiving capacity of the power is 11,750 K.V.A. Besides this we have own generating plant of 1500 K.V.A.

(h) Other plans -

(1) The plan to develope the rest parts of the coal field -

At present the strip developed already is about 17,000 m, so that we have 7,000 m undeveloped.

Among of them in Tonmaro (the central part between Kansan and Sanpo, 2,600 m in its strikewides). The coal seams are not in good condition, but in Ranchi-inz (eastwards of Sanpo, 1,100 m in its strikewides) in Sani (the eastside of Kansan, 1,800 m in its strikewides) and in Shing-rongkon (the westwards of Taichii, 1,800 m in its strikewides), they are comparatively in good condition. So that we had plan to develop them and had begun to work at Shing-rongkon 1st last year.

(2) The plan of developing deep parts -

As the thickness of the coal seam is very thin and the dip of the same is comparatively steep, the working centre progresses downwards almost 15 m in a year an average.

At present as the load center is at 255 m depth from the surface of the gound, the coal in this shallow part (above 450 m) will be worked out after 10 years or more. So that we had planned the development of deep parts under 450 m.

(i) The figures -

(1) The main equipments in the pit -

| Names | Numbers | Horsepowers |
|---|---|---|
| Winding machines<br>(In the shaft at Kansan) | 2 | 1,000 up |
| do (In the slope) | 37 | 4,654 do |
| Endless do | 12 | 310 do |
| Compressors | 34 | 3,850 do |
| Main fans | 7 | 1,550 do |
| Transformers | 9 | 11,750 do |
| Pumps | 54 | 5,054 do |
| Tubs | 3,600 | - |
| Drills | 249 | - |
| Electric lamps (cap lump) | 13,500 | - |

(2) The amount of products in 33 and 34 year -

| | Planned (in 33 year) | Real out-puts (in 33 year) | Planned (in 34 year) |
|---|---|---|---|
| Kansan | 480,000 tons | 456,814 tons | 520,000 tons |
| Sanpo | 220,000 do | 234,512 do | 220,000 do |
| Taichii | 550,000 do | 546,774 do | 560,000 do |
| TOTAL | 1,250,000 do | 1,238,300 do | 1,310,000 do |

(3) The working efficiency during recent 5 years -

(The following figures shows amount of product in tons per man per day).

| | Kansan | Sanpo | Taichii | Total average |
|---|---|---|---|---|
| 29 year | 0.30 tons | 0.18 | 0.21 | 0.22 |
| 30 " | 0.31 " | 0.22 | 0.21 | 0.23 |
| 31 " | 0.28 " | 0.20 | 0.27 | 0.24 |
| 32 " | 0.33 " | 0.26 | 0.29 | 0.30 |
| 33 " | 0.34 " | 0.26 | 0.38 | 0.30 |

(7) The labour problems:

The comparison between the planned numbers about laboures decided by the government in 34 year of Mingo and the actual result of those obtained in 33 year is as follows:

| | Result (33 year) | Plan (34 year) |
|---|---|---|
| Wanted | 16,186 | 17,112 |
| Products man/day | 0.27 tons | 0.308 ton |
| Working % | 75% | 73% |
| Employment & Retirement ratio | 139% | 138% |
| Collection (employed) | 21,577 | 23,399 |
| Coal production | 1,238,300 tons | 1,310,000 tons |

As this figure shown, it had been feared to obtain the successful realization of the plan, we had adopted new devised policies as follows:

(a) In order to hold the very number of the labourers wanted, we had strengthen our policy to breed and assist our patron villages and to let the people hold the intention to go to our mine to work underground by theirselves.

(b) To decrease the retirement percentage and to increase the working percentage, we had given the wages 50 percent or more higher than ever and supplied more over the necessities. We had given a good treatment to the technical expert who serviced for many years in this mine. In order to let them have a comfortable life, we had given some domestic industry in small scale to their families. Beside these, we had opened a private school at Taichii to educate their children and that became the good talk of the town. We had did our best to decrease the death and illness rate of the labourers and their families.

(c) The existing number of to labourers on 13th August last year is as follows -

| | Head Office | Kansan | Sanpo | Taichii | Total |
|---|---|---|---|---|---|
| Assistants of the member | 55 | 36 | 26 | 30 | 147 |
| Bosses of the labour | 360 | 180 | 98 | 158 | 796 |
| Daily wages labourers | 1,211 | 1,260 | 742 | 1,488 | 4,701 |
| Piece work labourers | - | 3,129 | 2,325 | 3,562 | 9,016 |

(8) The financial affairs:

(a) The financial situation at the beginning of the company. (Assets)

| | |
|---|---|
| Capital unpaid | Y 14,321,250.00 |
| Fixed assets | 42,940,270.00 |
| Working material-necessities of life - stocked | 4,510,059.88 |
| Stocked products of coal | 490,339.67 |
| Deposit in Manchurian heavy industrial company | 4,544,776.68 |
| Sales on credit | 180,582.95 |
| Receivable unpaid | 440,210.34 |
| Deposit in bank | 331,316.01 |
| Cash in hand | 27,604.45 |
| Suspense payment | 3,240,734.29 |
| Establishment fee of the company | 228,973.42 |
| TOTAL | Y71,256,118.25 |

NOTICE -

The fixed assets above mentioned is itemized in those as
Right for mine lots
Opening expences
Developments
Lands
Buildings
Equipments
Machineries
Locomotives and cars
Tools and instruments
Under constructions

(Liabilities)

| | |
|---|---|
| Capital | Y 60,000,000.00 |
| Debt (Manchuria Collieries Co.) | 6,238,218.19 |
| Purchases on credit | 317,887.74 |
| Payable unpaid | 1,955,819.90 |
| Deposit of the members | 431,712.56 |
| Caution money do | 396,351.26 |
| Suspense receipt | 1,912,077.00 |
| Security money | 4,031.60 |
| TOTAL | 71,256,118.25 |

(b) Concerning business affairs -

As to the business affairs for the past 2 ficical years (4 settlement terms) from the beginning of the company on 1st March 32 year of Mingo to 31th March, 34 year of the same, we do not say in detail as it can be acknowledged by the profit accounts under mentioned.

| | 1st term | 2nd term | 1st term | 2nd term |
|---|---|---|---|---|
| | (32 year) | | (33 year) | |
| (Profit) | | | | |
| Carried | - | 477,146.98 | 502,473.80 | 481,453.17 |
| Profit in this term | 1,963,146.98 | 1,218,227.23 | 1,060,195.37 | 1,281,125.43 |
| TOTAL | 1,963,146.98 | 1,765,374.21 | 1,562,669.17 | 799,672.26 |
| (Division) | | | | |
| Legal fund | 100,000.00 | 64,000.00 | 54,000.00 | - |
| Private fund | 300,000.00 | 250,000.00 | - | - |
| Bonus for directors | - | 15,500.00 | 18,166.00 | - |
| Dividend | 1,066,000.00 | 933,400.41 | 1,009,050.00 | - |
| Carried | 497,146.98 | 502,473.80 | 481,453.17(-) | 799,672.26<br>(-) |
| TOTAL | 1,963,146.98 | 1,765,374.21 | 1, 562,669.17 | 799,672.26 |

NOTICE -

The cause of the bad result in the 2nd business term 33 year is due to the sudden rise of prices of the materials, and moreover to the high caused by the sudded rise of the livelihood goods.

At the same time the shortage of the products must be taken into accounts as one of the important reasons.

These difficulties had been suffered not only in Peipyo mine but also in every coal mine in Manchuria, so that the government had determined to raise the prices of coal.

| | | |
|---|---|---|
| Original price | (Peipyo coal) | about 29 Y per ton on the average |
| Raised price | do | about 42Y per ton |

(c) The balance sheet at the end of the term 31st March 34 year.

(Assets)

| | |
|---|---|
| Capital unpaid | Y 9,547,500.00 |
| Fixed assets | 50,021,120.19 |
| Working materials - necessities of life - stocked | 9,639,333.14 |
| Stocked products | 857,431.59 |
| Deposit in short time | 396,440.00 |
| Sales on credit | 2,522,921.06 |
| Receivable unpaid | 1,531,725.79 |
| Bank account - cash in hand | 258,824.95 |
| Suspense payment | 6,651,463.83 |
| Security payment | 21,770.00 |
| Formation expenses | 137,000.00 |
| Los Act. in the term | 1,281,125.43 |
| TOTAL | 82,866,655.98 |

(Liabilities)

| | |
|---|---|
| Capital | Y60,000,000.00 |
| Reserved fund | 847,725.61 |
| Debt in short time | 12,934,155.23 |
| Current Act. payable | 1,417,616.19 |
| Purchases on credit | 623,809.20 |
| Payable unpaid | 1,802,773.92 |
| Deposit and caution - money of the member | 1,815,532.41 |
| Suspense receipt | 1,820,318.30 |
| Security money | 3,211.60 |
| Mutual aid - association act. | 129,950.35 |
| Reserved for tax | 990,100.00 |
| Profit carried | 481,453.17 |
| TOTAL | 82,866,655.98 |

(d) As to the situation from April 1st to August 14th when the oriental war was over.

As almost all the counting documents, books and slips had been robed of or lost, we cannot explain about it now, but as the accountants are now under resettlement we will be able to show it before long.

In our remembrance the business situation in the term would not be bad, because the expenses would have been paid by the rise of the coal price, and the assets would have been increased a little by the completion of those buildings which had been under construction then.

(e) After the stoppage of the war.

The business of the company since 15th August to 27th of the same month had been dealt with by us in our own liability and then it had been succeeded by Peipyo public peace maintaining committee and continued to 3rd October when Paro troops had invaded in here.

Of course we had supported the committee on their business but the actual business during that period had been very little. The losses of all sorts of mining materials, locomotives, motor cars, stocked coal, necessities of life and others sustained by Russian troops during above mention period were extremely enormous. As to the details of them we are now investigating.

(9) Concerning the mining materials:

At the end of July last year the amount of working materials in storage was estimated 3,760,000 Y. It seems to be too much, though several materials of which were always running short through the year. For example the timbers were wanted very often in consequence of the lack of cars of the railway company, the explosives were also wanted so often owing to the decrease of its products, and the want of ball or roller bearings brought the lack of tubs surely, the cast steel the tools and the electric materials were supplied very little by means of their less products or the decrease of import from Japan, moreover as the construction materials as those timbers or cements were wanted also, almost all the constructions were rate or not completed.

The losses of materials by Russian or Paro troops might be enormous too, and the amount of stocks at present may be estimated as about 5,000,000 Y, but as the good quantity of important materials were lost, the future business here may become difficult. So that the purchasing section may be requested to do his best to gain such important materials as those above mentioned, in order to recover the products of previous day.

## HSIAN COAL MINES OF THE MINISTRY OF ECONOMICS

(Formerly Hsian Coal Mining Company, Ltd., a subsidiary
of the Manchuria Heavy Industries Company, Ltd.)

Location: Hsian, Manchuria

Date Visited: 16 June 1946 by Messrs. Thorne and Hendricks.

Date Put In Operation: Coal had been mined in this area for many generations and systematic mining was started by the Chinese several decades ago. In 1933, the Japanese started systematic expansion of production and development in the area.

Description of the Product: A number of coal analyses were examined and the following appeared to be a representative average:

| Volatile Matter | Fixed Carbon | Water | Ash | Sulfur | Calories |
|---|---|---|---|---|---|
| 32-35% | 37-45% | 7% | 14-20% | -1.0 | 6,000 |

(Fusing point of ash - $1,450^{\circ}$ C.)

Non-coking coal for steam generation and domestic uses, in the following sizes: run of mine; -2 Cm.; 2-7 Cm.; +7 Cm.; and mixtures of the last three sizes.

Best Previous Production and Year: Production in metric tons since 1933 is given below:

1933 - 321,813
1934 - 432,000
1935 - 624,000
1936 - 741,680
1937 - 802,060
1938 - 1,123,708
1939 - 1,290,987
1940 - 1,553,698
1941 - 1,678,120
1942 - 1,369,600
1943 - 1,809,800
1944 - 2,094,700
1945 - 876,799

Outline of Plant Equipment: There is one set of mine workings with 2 hoisting slopes and 3 sets of mine workings with 3 hoisting slopes each. There are 2 coal screening plants each with a washing plant that was operated for one week in the spring of 1945 and abandoned as not feasible. Other equipment is as follows:

| | |
|---|---|
| 1800 | wooden mine cars (0.5 ton) |
| 190 | iron mine cars (0.8 ton) |
| 640 | iron mine cars without bearings |

| | |
|---|---|
| 2 | steam locomotives |
| 9 | electric locomotives |
| 2 | 450 H. P. compressors for each slope |
| 1 or 2 | 300 H. P. drum hoists for each slope |
| 6 | rotary mine car dumpers (1 and 2 car capacity) |
| 1 | fan and fan motor for each slope |
| 1 | pump for each slope |
| 3800 | electric mine lamps |
| 36 | railroad cars |
| - | hospital, machine shops, foundry, woodworking shop |
| - | endless chain conveyors |
| - | a small but unknown number of pneumatic mining picks |

Number of Employees at Full Operation: 17,000 laborers and staff were employed at these mines in 1944, of whom 11,000 were underground workers.

Removals: The following equipment was reported to have been removed by Soviet troops and technicians:

| | |
|---|---|
| 2 | steam locomotives |
| - | much furniture from homes and personal property |
| - | all coal produced during the period of occupation |

Chinese Communists were reported to have removed the following:

| | |
|---|---|
| 90 | motors - 10 and 15 H. P. |
| 8 | transformers, small |
| 2 | milling machines |
| 4 | lathes |
| 2 | planers |
| 1 | electric drill |
| 2 | electric welding units |
| 900 | meters of conveyor belting |

Local residents and Communists removed ball bearings from 640 mine cars in addition to about 10,000 mine lamps.

Destruction: 2 compressors and compressor motors were smashed. Pumps were shut down for 4 days due to power failure and some workings were flooded but are now 80 per cent dewatered. This damage was all attributed to Chinese Communist forces.

Maximum Capacity Considered Practical to Restore: It is considered practical to restore the entire capacity of these mines as they are strategically located to supply steam and domestic coal to northeastern Manchuria.

Equipment Needed for this Restoration: All essential equipment has been restored except that ball bearings for mine cars, electric mine lamps, oil and grease, and some machine shop equipment would be needed for full scale operation. The greatest need is for dynamite and mine timbers. If all of these needs could be met the present labor supply is adequate to produce 2,000 tons of coal per day.

Source of Raw Materials: Dynamite was supplied by a central dynamite distributing company in Mukden. Mine timbers came from northern Manchuria near the Mutan River. Mine lamps came from Japan, as did motors and other machinery.

No source of the essential materials is known at present. Roller bearings of bronze are being made in the mine shop as a substitute for ball bearings.

Stockpiles: There is no dynamite on hand and the present supply of mine timbers is adequate for only one month of operation. There are 20,000 tons of coal on hand in stockpiles.

Former Distribution of Product: The coal was formerly distributed as follows: 200 tons per day for the steam power plant at Hsian; 80 tons per day for locomotives, shops, etc., at the mines; and the remainder for railroad, stationary steam generation, and domestic heating with the railroads using by far the greater part of the product. For example, 40 tons per day were used for heating and steam generation at the refinery and hydrogenation plant is Ssupingchieh.

Immediate Future Demands for the Product: Railroads and domestic heating during the next winter could utilize the maximum output of these mines. The acute shortage of domestic fuel in Manchuria in the winter of 1945-46 is indicated by the widespread stripping of Japanese houses of wood for fuel.

Former Plant Managers: The former Japanese general manager of the mines was S. Kitano and the chief accountant was Mr. Terada. The entire Japanese technical staff is still in Hsian, as no repatriation has been attempted as yet, and the four top men including the chief engineer have stated willingness to remain until the mines are in full operation.

Present Plant Manager: Mr. Pan, Chi-Hu, NEC.

Soviet Officials Handling Removals: Soviets arrived in Hsian in September (either 4 Sept. or 12 Sept.) and departed March 10, 1946. The Russian in charge was Mr. Agippo, a White Russian mining engineer from Harbin. A Mr. Gusakofsky was a Communist party man assigned to watch the operations.

Notes on Process: The coal field is a basin of rocks of Jurassic Age, 9.5 km long by 4.0 km wide that trends North Northeast. There is one main coal bed that thins and becomes a single bed toward the margins and thickens and splits into several seams toward the center. The maximum thickness of coal, in a drill hole in the center of the field, is 40 m 75 cm with 6 m of additional waste rock in three layers, and the average thickness is about 15 m. Dips into the basin average 15° to 25° on the margins and the coal is nowhere deeper than 700 m. The basin is broken into about 12 blocks by normal (gravity type) faults with vertical displacements varying from a few meters to as much as 500 m. Many of the faults dip at low angles so that belts as much as 200 m wide are underlain by no coal. The faults cause little trouble in mining, but local folds have resulted in a very irregular pattern of mine workings.

Normally the coal is worked in benches, starting from the bottom of the bed. Two benches are removed; then 1 m of coal is left and two additional benches are removed. The mining method is longwall, principally advancing, with handstowed rock pillars left for support. The rock for the pillars is obtained by mining out rock stopes in the roof.

The mines are gassy, the coal dust is explosive, and spontaneous combustion of coal occurs. Rock dusting is used to prevent coal dust explosions, a minimum of 3 $m^3$ of air per minute per man underground is supplied by turbo or Sirocco type exhaust fans. The mines make little water.

The coal basin has been systematically explored by diamond drilling. The reserves have been computed as 150,000,000 metric tons of which it is estimated that 60 per cent can be recovered in mining.

The only coal cleaning is by hand picking of the larger sizes.

Remarks: Information was obtained from the Chinese manager, Mr. Pan Chi-hu, and members of his staff, and directly from Japanese officials who had been in charge. Mr. S. T. Chang of the office of the Northeast Economic Commission in Ssupingchieh aided and acted as Japanese interpreter.

There were formerly 779 Japanese on the staff at the mine; 522 have been retained on the staff and it is proposed to retain 150 to 200 for a brief additional period after repatriation starts. In addition to the staff, it is proposed to keep all mine rescue squads to train Chinese in rescue work, as no Chinese were previously permitted to participate in such work. Women are used in surface work such as the screening and hand picking. Boys of 15 years of age or less used extensively both on the surface and underground. The Chinese manager, Mr. Pan, informed us that the boys were imported from Japan by the Japanese Government as "youthful pioneers of Manchuria".

That Hsian was a haven for Japanese is indicated by the fact that 3500 Japanese were formerly there (2000 according to one report), and now there are 9700. Most of the additional ones came from Changchun and north of Changchun. The reasons given for this was that the coal mines provided employment.

During Soviet occupation coal production rose from 12,561 tons in September to 55,845 tons in March. Production in May was 25,065 tons.

PREPARED BY

Thomas A. Hendricks

## MANSHU SUMITOMO KINZOKU KOGYO K.K.
(Manchurian Sumitomo Metal Industry, Ltd.)

Location: Tetsunishi-ku District, Mukden

Date Visited: 1 June 1946

The writer visited this plant accompanied by Dr. Shao of the Northeast Chinese Economic Commission. This was a well-equipped plant for manufacturing tires for passenger and freight car and locomotive tires, axles, and forged and cast parts for locomotives and heavy machinery.

Its principal equipment consisted of two 6-ton Heroult-type electric melting furnaces, three 30-ton open-hearth furnaces, 3 cupolas, a good steel foundry, a fair gray iron foundry, an excellent tire shop and well-equipped forge and machine shops.

The principal products were car and locomotive tires. Ingots cast from metal from the electric furnaces were grooved in three ingot slicing machines. Each ingot was grooved at about 10-inch intervals and the grooved ingots were broken into sections by a breaking machine. Each section then was reheated, placed in a large press and pressed into a doughnut-shaped tire blank. These were placed in a roughing roll and rolled out into approximate annular size and then rolled to finished size and contour in a finishing roll. The locomotive tires were heat treated, oil hardened and tempered.

According to Report No. 12 from the U.S. Assistant Military Attache at Mukden (Source File 303-J-1), information from the Factory Branch of Mukden Japanese Residents Association credited this plant with a production prior to August 15, 1945 of the following annual tonnages:

| | |
|---|---|
| Carbon steel | 300 |
| Railroad tires | 200 |
| Wheels and axles for passenger and freight cars | 270 |
| Axles for freight cars | 70 |
| Locomotive chassis (frames) | 20 |
| Cast steel parts | 30 |
| Forged steel parts | 15 |
| Assembled parts, etc. | 110 |

The same source reports 2,173 employees, including 1438 Chinese, 690 Japanese and 45 Koreans.

This report No. 12 relates in detail certain removals and damage. We verified the absence of key equipment, including two electric furnaces, six and possibly seven presses, three ingot grooving or slicing machines, one grooved ingot-breaking machine, two accumulators and one crane removed and one crane with one end off runway and on ground. In addition, it was evident that substantial numbers of lathes, gear shapers, milling machines and drill presses had been removed.

While it is true that the open-hearths, steel foundry and gray iron foundry remain intact, the removal of the presses, ingot groovers, ingot breaker and tire roughing and finishing rolls reduces the scope of plant operations almost to that of a mediocre gray iron foundry, steel foundry and forge shop operation. Considerable rehabilitation would be necessary to effect even this limited activity. The principal activity of tire manufacture is prohibited by the absence of presses, ingot groovers and breaker and roughing and finishing rolls—all essential, single-purpose items of equipment.

PREPARED BY

E. L. Shaner

## FUSHUN IRON WORKS

Location: Extreme west end of the Fushun industry group

Date visited: 3 June 1946, by E. L. Shaner and Capt. E. M. Scott

We were told by the Japanese manager that the plant was built in 1934, primarily to make sponge iron from ore received from the Pen-chihu district. The plant consisted of two rotary kilns for roasting the ore, six electric arc melting furnaces of the Heroult type, one high-frequency induction furnace, two rolling mills, a ferro-alloy shop, a shop for making hollow drill rods, forge shop, machine shop and the usual crushing, conveying and other equipment.

We were informed that the Soviets removed equipment shown on inventories in Source File 1-A-4, in the period between September 20 and November 10. The larger rotary kiln and cooler, three of the electric arc furnaces and the high-frequency induction furnaces were removed, as well as numerous cranes, steam hammers, machine tools and practically everything in the testing laboratories. The rope-driven rod mills were not damaged in any marked degree.

In reply to questioning, we were told that the plant had a rated capacity of 23,000 metric tons of sponge iron per year. However, the second or larger rotary kiln had never been in operation. This was the one the Soviets were said to have removed. The older kiln, with a rated capacity of 9,000 tons annually, actually had produced only 8,000 tons. The manager admitted that the process was not considered entirely satisfactory, that the cost of production was prohibitive and the whole operation uneconomic except under stress of war.

One curious aspect of the removal of the kiln is that the fire-brick was removed, placed in a crudely built building and apparently hidden from view by sheet iron and matting covering the building walls. Also, the kiln, 3 meters in diameter, was torchcut in sections 3 meters long for shipment. New plate steel, scattered all over the industrial sections of Manchuria could have been shipped flat and fabricated in the USSR much easier and cheaper than the cut sections can be reassembled and welded, even granting they were not damaged in transit.

The claims as to equipment taken away seem to be substantially correct. There are a few discrepancies. For instance, two cranes, listed as 30-ton, probably were 15 ton, judging from the sizes of those remaining.

If this plant were to be operated again, the logical procedure would be to use the three remaining electric arc furnaces for melting steel for the intact rolling mills. This would require a considerable redistribution of cranes and a replacement of much electrical equipment. Whether or not even this limited rehabilitation would be economical depends entirely upon how urgently the output of such a plant will be needed.

Production of this plant prior to August 15, as reported to us by C. Y. Cheng, of the Northeast Chinese Economic Commission, was 164 tons of sponge iron, 966 tons of steel ingots and 855 tons of rolled steel per month. After August 15, but before removal of equipment, output was 21 tons of steel ingots and 70 tons of rolled steel per month. No sponge iron was produced after August 15.

PREPARED BY

E. L. Shaner

# MANSHU IRON COMPANY, LTD.

**Location:** Anshan, Liaoning Province

**Date Visited:** 12 and 13 June, 1946, by Messrs. Hurndall, Shaner, Elias, and Johnston, accompanied by Captain Fenical and Dr. Shao of the Northeast Chinese Economic Commission

## Concentration, Sintering, Briquetting, Sponge-Iron and Blast Furnace Departments of the Anshan Works

### Iron Ore.

Iron ore for the Anshan works comes from iron deposits 10 to 30 miles east of Anshan where a range of hills contains large quantities of low grade ore with pockets of high grade scattered through them. Mining is done by open pits, glory holes, and underground stoping at various places along the range of hills. An electrified railroad connected the mines to the steel plant.

The ores are a mixture of magnetite and hematite both of which are hard and dense. At each mine the ore is crushed to 4 inches and screened on a 1/2 inch screen. Some hand sorting is done. Ores are classified into four groups, viz., (1) rich lump for the blast furnaces, (2) rich fines for the sintering plant, (3) lean lump for the concentrating plant, and (4) lean fines for the sponge iron plant. Rich ores average about 50 per cent iron while lean ores contain only about 35 per cent. Ore reserves are estimated to be 4 billion tons of lean ore and 49 million of rich ore.

During 1943, the peak year, the following tonnages of ore were treated at Anshan:

| | |
|---|---|
| Rich lump ore, blast furnaces | 1,746,026 |
| " fine ore, sintering & briquetting | 217,497 |
| Lean lump ore, concentration plant | 1,406,818 |
| " fine ore, sponge iron plant | 52,703 |
| Total | 3,423,044 tons |

### Ore Concentration.

Lean ore with the fines screened out is concentrated by a reducing roasting step followed by crushing, grinding and magnetic separation. The reducing roast is done in specially developed Umene furnaces in which reduction is effected by passing coke oven gas upward through a downward moving column of ore preheated to 600 - 700 degrees C. In addition to producing the chemical change which makes the iron magnetic and so capable of concentration by magnetic methods, the roasting treatment also causes incipient cracking which fact aids the subsequent steps of crushing and grinding. There are 23 of these furnaces each with a daily capacity of 230 to 300 tons.

The roasted ore is crushed in jaw crushers and rolls and then ground in ball mills in closed circuit with classifiers to minus 150 mesh. The finely ground ore is then concentrated on Grondal magnetic separators from which the concentrates are recovered and sent to the sintering plant. The average concentrates contain 56.5 per cent iron and 17 per cent silica while the wasted tailings contain 13 per cent iron. Recovery is about 75 per cent of the iron which is contained in 46 per cent of the weight of the original ore as fed to the roasting furnaces.

Besides the concentrates and tailings, a middling product is made which receives further treatment in ball mills, classifiers, callow cells, and filters located in a separate building. An additional 5 per cent of the total iron is thus recovered in high grade concentrates that are briquetted before going to the blast furnaces. Illustrative of the concentration of ores is the following data taken from the company records of 1943:

| | TONS | % IRON | % SILICA |
|---|---|---|---|
| Ore to concentrating plant | 1,406,818 | 35 | 45 |
| Concentrates produced | 652,642 | 56.5 | 17 |
| Middlings " | 391,941 | 18.7 | -- |
| Tailings " | 462,236 | 13.2 | -- |
| Retreatment of middlings | | | |
| Concentrates produced | 39,194 | 52.7 | -- |
| Tailings " | 352,747 | 13.4 | -- |

Sintering.

The ore concentrates are mixed with 10 per cent coal and 6 per cent lime and sintered on Dwight-Lloyd Sintering machines. Four large machines and 6 small ones have a combined capacity of 72,000 tons per month. Blast furnace flue dust and rich fines are also mixed with the charge to the sintering machines which are fired by crude oil. The sintered product is a porous, agglomerated mass suitable for blast furnace feed. The sintering machines are located in four large buildings near the concentrating plant and within a short haul to the blast furnace storage bins.

Briquetting.

Concentrates obtained from retreating the middlings of the main plant are mixed with fine high grade ore and lime and then briquetted and burned according to the Grondal process. Hard, firm briquettes 8 inches square and 2 inches thick are produced by heating to 1250 degrees C. The briquettes are used as part of the blast furnace charge but were not considered as good as sintered ore so the capacity of 200,000 tons per year was not reached.

Sponge Iron.

The fines from lean ore (35 percent Fe) are treated by the Krupp-Renn process and made into sponge iron. A separate plant contains 4 rotary kilns 200 feet long and 11 feet in diameter and auxiliary equipment for treating the kiln production. Ores, coke breeze, and blast furnace slag were charged to the kilns which were fired by pulverized coal. The final product consisted of iron pellets called "Luppe", 80 per cent of which was less than 1 inch in size.

Production capacity was rated at 240 tons per day for the plant but operations were usually confined to one kiln at a time so that the maximum production was only 18,000 tons for 1943, all of which was shipped to Japan. The product contained 0.3 to 0.6 per cent sulfur.

Cost per ton of finished product was estimated at twice the cost of producing pig iron but in 6 years practice the cost of production was reduced to equal the cost of pig iron which was estimated to be about $40 per ton in 1943.

Blast Furnaces.

The blast furnace department started with two 400-ton-per-day furnaces in 1919. Another was added in 1930 and more in subsequent years until 9 stacks with a total rated capacity of 5,450 tons of pig iron per day were erected. These are listed below as follows:

| Blast Furnace No. | Year Built | Pig Iron Capacity |
|---|---|---|
| 1 and 2 | 1919 | 400 x 2 equals 800 tons |
| 3 | 1930 | 550 x 1 " 550 " |
| 4 | 1937 | 600 x 1 " 600 " |
| 5, 6, 7, & 8 | 1938 | 700 x 4 " 2800 " |
| 9 | 1943 | 700 x 1 " 700 " |
| | Total | 5450 " |

With a rated annual capacity of 1,950,000 tons of pig iron, plans were to produce 1,460,000 tons but the production of 1,325,000 of 1943 was the peak. Of this production 37 per cent was basic pig iron containing 1.8 to 2.5 per cent Si and less than 0.08 per cent sulfur. 59 per cent of the pig iron was sent to the steel mills in the molten state and 41 per cent cast into pigs.

All furnaces are German type, except No. 3 which is American type, and use the cylindrical shaped tub with cone-shaped bottom for charging.

## Blast Furnace Charge.

A typical blast furnace charge and annual consumption of materials is listed as follows:

| | | Wt. per Ton Pig | % | Year 1943 |
|---|---|---|---|---|
| Sintered Ore ( | | (565 kg | 14.5 | 723,264 tons |
| Briquetted Ore ( | | (132 | 3.4 | 149,033 |
| Hematite Lump Ore ( | 49.66% Fe | (780 | 20.0) | 1,746,026 |
| Magnetite ( | 17.76% $Si_{O2}$ | (538 | 13.9) | --- |
| Open Hearth Slag ( | | ( 88 | 2.3 Dolo. | 62,212 |
| Flux (52.3% CaO) | | 582 | 15.0 | 693,890 |
| Coke (18.2 Ash) | | 1200 | 30.9 | 1,559,602 |
| Total | | 3885 | 100.0 | 4,934,027 |

The foregoing gives some idea of the magnitude of the plant and the methods used for preparing ore and producing pig iron. The equipment necessary to carry out the various steps is extensive and is the result of a great deal of planning, cost and work. The fact that peak production was reached in 1943 and not in 1944 was due to a combination of air raids, labor shortage and general breakdown of the organization resulting from the war.

## Removal of Equipment.

In each department of the plant where one operation is performed there were removals of equipment by the Soviets between September 1945 and February 1946. In most cases the equipment removed is only a fraction of the whole installation but that fraction constituted a vital missing link that prevents the whole unit from operating. The actual cost of a missing machine as quoted by manufacturers does not represent the value of the machine when measured in lost production and cost of replacement.

While the following lists are not complete in detail, they serve to show the crippling effect of removals:

(a) Iron Mines:

Shovels, compressors, air drills, pipe lines, drill steel, hoists, cars, crushers, screens and auxiliary equipment.

(b) Ore Roasting Plant:

All conveyor belts, motors, and small equipment but not the roasting furnaces.

(c) Concentrating Plant:

All conveying belts, drive mechanism and idlers, 5 crushers, 14 ball mills with classifiers, 90 magnetic separators, 12 sets of thickener tank mechanism, 9 filters, 2 vacuum pumps, 5 water pumps, and all meters for this equipment.

PREPARED BY

T. L. Johnston

# ANSHAN STEELWORKS AND ROLLING MILLS

| | |
|---|---|
| **Name of Company:** | Manshu Iron Company, Ltd. |
| **Location:** | Liaoning Province, Anshan |
| **Date Plant Established:** | No. 1 Steelworks was built in 1935. No. 2 Steelworks was built in 1940. |
| **Products:** | Steel ingots and rolled steel products as listed in detail under "production". |
| **Number of Employees:** | See elsewhere in report. |
| **Date Visited:** | 12 and 13 June, 1946, by Messrs. Hurndall, Shaner, Elias, and Johnston, accompanied by Captain Fenical and Dr. Shao of the Northeast Chinese Economic Commission. |

## Steel Works (Nos. 1 and 2)

No. 1 Steelworks is housed in a building extending east and west on a site north of Nos. 5, 6, 7, and 8 blast furnaces. The principal equipment consists of one 600-ton mixer, three 300-ton tilting active mixers, four 100-ton basic open-hearth furnaces (tilting), two 150-ton tilting basic open-hearth furnaces, six soaking pit furnaces and the necessary charging machines, cranes, ingot strippers, ladles and ladle cranes, etc. From west to east in No. 1 Steelworks, the equipment is arranged in the following order: one 600-ton mixer, two of the three 300-ton tilting active mixers, the four 100-ton tilting basic open-hearth furnaces, the third tilting active mixer and finally the two 150-ton tilting basic open-hearth furnaces.

Hot metal from the blast furnaces is charged first into the 600-ton mixer and then into the active mixers. In the latter 170 kg of iron ore and 50 kg of lime per ton of metal also are added. After treatment in the active mixers, the metal is drawn off and charged into the open-hearths. Here the normal charge is about 85 per cent iron and 15 per cent scrap, the latter being almost entirely mill scrap. About 50 kg of lime, 150 kg of ore, 3 kg of fluorspar and varying amounts of mill scale per ton of steel also are charged into the open-hearths.

We were informed that the steelworks averaged a little more than two heats per day for the open-hearths in operation. A melt of about 160 tons per heat was reported on the 150-ton furnaces. However, considerable operating time must have been lost due to the short life of refractories. We were told that the average life of roof and backwalls was only 60 heats. The life of bottoms was reported as 2 years. Fluorspar for the open-hearth charge was obtained from Korea.

Of the six soaking pit furnaces, 4 are of the single type and 2 are of the gas burner type. Ingots were bottom-poured, about 5 tons in weight. Normally ingots remained in the casting pit about two hours and in the soaking pits three hours.

The No. 2 Steelworks is housed in a building west of No. 1 Steelworks. This building extends in a north-south direction. Its principal equipment consists of two 600-ton mixers, four 300-ton tilting active mixers, six 150-ton tilting basic open-hearth furnaces, the usual charging machines, cranes, ingot strippers and eight soaking pit furnace units--all of the gas burner type.

Arrangement of the equipment, from south to north, is as follows: two 600-ton mixers, two 300-ton tilting active mixers, four 150-ton tilting basic open-hearth furnaces, two 300-ton tilting active mixers, and two 150-ton tilting basic open-hearth furnaces. Practice in No. 2 Steelworks was similar to that in No. 1 Steelworks.

The capacity of Nos. 1 and 2 Steelworks is reported at various amounts ranging from 1,330,000 to 1,500,000 metric tons per year. Actual production never has mounted to anything approximating these capacities. According to information we believe to be reliable except as noted (because it was checked from independent sources) actual output of steel ingots was as follows:

| Year* | No. 1 Steelworks | No. 2 Steelworks | Total |
|---|---|---|---|
| 1935 | 211,560 | - | 211,560 |
| 1936 | 364,315 | - | 364,315 |
| 1937 | 516,349 | - | 516,349 |
| 1938 | 585,094 | - | 585,094 |
| 1939 | 529,606 | - | 529,606 |
| 1940 | 532,295 | - | 532,295 |
| 1941 | 561,372 | - | 561,372 |
| 1942 | 447,000 | 285,000 | 732,000 |
| 1943 | 430,000 | 414,000 | 844,000 |
| 1944 | | | 473,731** |
| 1945 | | | 150,000*** |

---

*Fiscal year is April-March, inclusive.

**Japanese at plant estimate output of both steelworks at 760,000 tons in 1944. Local records lost. Figure of 473,731 tons came from Tokyo.

***Estimate of Japanese at plant, April-August.

This report No. 12 relates in detail certain removals and damage. We verified the absence of key equipment, including two electric furnaces, six and possibly seven presses, three ingot grooving or slicing machines, one grooved ingot-breaking machine, two accumulators and one crane removed and one crane with one end off runway and on ground. In addition, it was evident that substantial numbers of lathes, gear shapers, milling machines and drill presses had been removed.

While it is true that the open-hearths, steel foundry and gray iron foundry remain intact, the removal of the presses, ingot groovers, ingot breaker and tire roughing and finishing rolls reduces the scope of plant operations almost to that of a mediocre gray iron foundry, steel foundry and forge shop operation. Considerable rehabilitation would be necessary to effect even this limited activity. The principal activity of tire manufacture is prohibited by the absence of presses, ingot groovers and breaker and roughing and finishing rolls--all essential, single-purpose items of equipment.

PREPARED BY

E. L. Shaner

# FUSHUN IRON WORKS

**Location:** Extreme west end of the Fushun industry group

**Date visited:** 3 June 1946, by E. L. Shaner and Capt. E. M. Scott

We were told by the Japanese manager that the plant was built in 1934, primarily to make sponge iron from ore received from the Penchihu district. The plant consisted of two rotary kilns for roasting the ore, six electric arc melting furnaces of the Heroult type, one high-frequency induction furnace, two rolling mills, a ferro-alloy shop, a shop for making hollow drill rods, forge shop, machine shop and the usual crushing, conveying and other equipment.

We were informed that the Soviets removed equipment shown on inventories in Source File 1-A-4, in the period between September 20 and November 10. The larger rotary kiln and cooler, three of the electric arc furnaces and the high-frequency induction furnaces were removed, as well as numerous cranes, steam hammers, machine tools and practically everything in the testing laboratories. The rope-driven rod mills were not damaged in any marked degree.

In reply to questioning, we were told that the plant had a rated capacity of 23,000 metric tons of sponge iron per year. However, the second or larger rotary kiln had never been in operation. This was the one the Soviets were said to have removed. The older kiln, with a rated capacity of 9,000 tons annually, actually had produced only 8,000 tons. The manager admitted that the process was not considered entirely satisfactory, that the cost of production was prohibitive and the whole operation uneconomic except under stress of war.

One curious aspect of the removal of the kiln is that the firebrick was removed, placed in a crudely built building and apparently hidden from view by sheet iron and matting covering the building walls. Also, the kiln, 3 meters in diameter, was torchcut in sections 3 meters long for shipment. New plate steel, scattered all over the industrial sections of Manchuria could have been shipped flat and fabricated in the USSR much easier and cheaper than the cut sections can be reassembled and welded, even granting they were not damaged in transit.

The claims as to equipment taken away seem to be substantially correct. There are a few discrepancies. For instance, two cranes, listed as 30-ton, probably were 15 ton, judging from the sizes of those remaining.

If this plant were to be operated again, the logical procedure would be to use the three remaining electric arc furnaces for melting steel for the intact rolling mills. This would require a considerable redistribution of cranes and a replacement of much electrical equipment. Whether or not even this limited rehabilitation would be economical depends entirely upon how urgently the output of such a plant will be needed.

Production of this plant prior to August 15, as reported to us by C. Y. Cheng, of the Northeast Chinese Economic Commission, was 164 tons of sponge iron, 966 tons of steel ingots and 855 tons of rolled steel per month. After August 15, but before removal of equipment, output was 21 tons of steel ingots and 70 tons of rolled steel per month. No sponge iron was produced after August 15.

PREPARED BY

E. L. Shaner

# MANSHU IRON COMPANY, LTD.

**Location:** Anshan, Liaoning Province

**Date Visited:** 12 and 13 June, 1946, by Messrs. Hurndall, Shaner, Elias, and Johnston, accompanied by Captain Fenical and Dr. Shao of the Northeast Chinese Economic Commission

## Concentration, Sintering, Briquetting, Sponge-Iron and Blast Furnace Departments of the Anshan Works

### Iron Ore.

Iron ore for the Anshan works comes from iron deposits 10 to 30 miles east of Anshan where a range of hills contains large quantities of low grade ore with pockets of high grade scattered through them. Mining is done by open pits, glory holes, and underground stoping at various places along the range of hills. An electrified railroad connected the mines to the steel plant.

The ores are a mixture of magnetite and hematite both of which are hard and dense. At each mine the ore is crushed to 4 inches and screened on a 1/2 inch screen. Some hand sorting is done. Ores are classified into four groups, viz., (1) rich lump for the blast furnaces, (2) rich fines for the sintering plant, (3) lean lump for the concentrating plant, and (4) lean fines for the sponge iron plant. Rich ores average about 50 per cent iron while lean ores contain only about 35 per cent. Ore reserves are estimated to be 4 billion tons of lean ore and 49 million of rich ore.

During 1943, the peak year, the following tonnages of ore were treated at Anshan:

| | |
|---|---|
| Rich lump ore, blast furnaces | 1,746,026 |
| " fine ore, sintering & briquetting | 217,497 |
| Lean lump ore, concentration plant | 1,406,818 |
| " fine ore, sponge iron plant | 52,703 |
| Total | 3,423,044 tons |

### Ore Concentration.

Lean ore with the fines screened out is concentrated by a reducing roasting step followed by crushing, grinding and magnetic separation. The reducing roast is done in specially developed Umene furnaces in which reduction is effected by passing coke oven gas upward through a downward moving column of ore preheated to 600 - 700 degrees C. In addition to producing the chemical change which makes the iron magnetic and so capable of concentration by magnetic methods, the roasting treatment also causes incipient cracking which fact aids the subsequent steps of crushing and grinding. There are 23 of these furnaces each with a daily capacity of 230 to 300 tons.

The roasted ore is crushed in jaw crushers and rolls and then ground in ball mills in closed circuit with classifiers to minus 150 mesh. The finely ground ore is then concentrated on Grondal magnetic separators from which the concentrates are recovered and sent to the sintering plant. The average concentrates contain 56.5 per cent iron and 17 per cent silica while the wasted tailings contain 13 per cent iron. Recovery is about 75 per cent of the iron which is contained in 46 per cent of the weight of the original ore as fed to the roasting furnaces.

Besides the concentrates and tailings, a middling product is made which receives further treatment in ball mills, classifiers, callow cells, and filters located in a separate building. An additional 5 per cent of the total iron is thus recovered in high grade concentrates that are briquetted before going to the blast furnaces. Illustrative of the concentration of ores is the following data taken from the company records of 1943:

| | TONS | % IRON | % SILICA |
|---|---|---|---|
| Ore to concentrating plant | 1,406,818 | 35 | 45 |
| Concentrates produced | 652,642 | 56.5 | 17 |
| Middlings " | 391,941 | 18.7 | -- |
| Tailings " | 462,236 | 13.2 | -- |
| Retreatment of middlings | | | |
| Concentrates produced | 39,194 | 52.7 | -- |
| Tailings " | 352,747 | 13.4 | -- |

## Sintering.

The ore concentrates are mixed with 10 per cent coal and 6 per cent lime and sintered on Dwight-Lloyd Sintering machines. Four large machines and 6 small ones have a combined capacity of 72,000 tons per month. Blast furnace flue dust and rich fines are also mixed with the charge to the sintering machines which are fired by crude oil. The sintered product is a porous, agglomerated mass suitable for blast furnace feed. The sintering machines are located in four large buildings near the concentrating plant and within a short haul to the blast furnace storage bins.

## Briquetting.

Concentrates obtained from retreating the middlings of the main plant are mixed with fine high grade ore and lime and then briquetted and burned according to the Grondal process. Hard, firm briquettes 8 inches square and 2 inches thick are produced by heating to 1250 degrees C. The briquettes are used as part of the blast furnace charge but were not considered as good as sintered ore so the capacity of 200,000 tons per year was not reached.

## Sponge Iron.

The fines from lean ore (35 percent Fe) are treated by the Krupp-Renn process and made into sponge iron. A separate plant contains 4 rotary kilns 200 feet long and 11 feet in diameter and auxiliary equipment for treating the kiln production. Ores, coke breeze, and blast furnace slag were charged to the kilns which were fired by pulverized coal. The final product consisted of iron pellets called "Luppe", 80 per cent of which was less than 1 inch in size.

Production capacity was rated at 240 tons per day for the plant but operations were usually confined to one kiln at a time so that the maximum production was only 18,000 tons for 1943, all of which was shipped to Japan. The product contained 0.3 to 0.6 per cent sulfur.

Cost per ton of finished product was estimated at twice the cost of producing pig iron but in 6 years practice the cost of production was reduced to equal the cost of pig iron which was estimated to be about $40 per ton in 1943.

## Blast Furnaces.

The blast furnace department started with two 400-ton-per-day furnaces in 1919. Another was added in 1930 and more in subsequent years until 9 stacks with a total rated capacity of 5,450 tons of pig iron per day were erected. These are listed below as follows:

| Blast Furnace No. | Year Built | Pig Iron Capacity | | | |
|---|---|---|---|---|---|
| 1 and 2 | 1919 | 400 x 2 | equals | 800 | tons |
| 3 | 1930 | 550 x 1 | " | 550 | " |
| 4 | 1937 | 600 x 1 | " | 600 | " |
| 5, 6, 7, & 8 | 1938 | 700 x 4 | " | 2800 | " |
| 9 | 1943 | 700 x 1 | " | 700 | " |
| | | Total | | 5450 | " |

With a rated annual capacity of 1,950,000 tons of pig iron, plans were to produce 1,460,000 tons but the production of 1,325,000 of 1943 was the peak. Of this production 37 per cent was basic pig iron containing 1.8 to 2.5 per cent Si and less than 0.08 per cent sulfur. 59 per cent of the pig iron was sent to the steel mills in the molten state and 41 per cent cast into pigs.

All furnaces are German type, except No. 3 which is American type, and use the cylindrical shaped tub with cone-shaped bottom for charging.

## Blast Furnace Charge.

A typical blast furnace charge and annual consumption of materials is listed as follows:

| | | | Wt. per Ton Pig | % | Year 1943 |
|---|---|---|---|---|---|
| Sintered Ore | ( | | (565 kg | 14.5 | 723,264 tons |
| Briquetted Ore | ( | | (132 | 3.4 | 149,033 |
| Hematite Lump Ore | ( | 49.66% Fe | (780 | 20.0) | 1,746,026 |
| Magnetite | ( | 17.76% $Si_{O2}$ | (538 | 13.9) | --- |
| Open Hearth Slag | ( | | ( 88 | 2.3 Dolo. | 62,212 |
| Flux (52.3% CaO) | | | 582 | 15.0 | 693,890 |
| Coke (18.2 Ash) | | | 1200 | 30.9 | 1,559,602 |
| Total | | | 3885 | 100.0 | 4,934,027 |

The foregoing gives some idea of the magnitude of the plant and the methods used for preparing ore and producing pig iron. The equipment necessary to carry out the various steps is extensive and is the result of a great deal of planning, cost and work. The fact that peak production was reached in 1943 and not in 1944 was due to a combination of air raids, labor shortage and general breakdown of the organization resulting from the war.

## Removal of Equipment.

In each department of the plant where one operation is performed there were removals of equipment by the Soviets between September 1945 and February 1946. In most cases the equipment removed is only a fraction of the whole installation but that fraction constituted a vital missing link that prevents the whole unit from operating. The actual cost of a missing machine as quoted by manufacturers does not represent the value of the machine when measured in lost production and cost of replacement.

While the following lists are not complete in detail, they serve to show the crippling effect of removals:

(a) Iron Mines:

Shovels, compressors, air drills, pipe lines, drill steel, hoists, cars, crushers, screens and auxiliary equipment.

(b) Ore Roasting Plant:

All conveyor belts, motors, and small equipment but not the roasting furnaces.

(c) Concentrating Plant:

All conveying belts, drive mechanism and idlers, 5 crushers, 14 ball mills with classifiers, 90 magnetic separators, 12 sets of thickener tank mechanism, 9 filters, 2 vacuum pumps, 5 water pumps, and all meters for this equipment.

PREPARED BY

T. L. Johnston

# ANSHAN STEELWORKS AND ROLLING MILLS

| | |
|---|---|
| Name of Company: | Manshu Iron Company, Ltd. |
| Location: | Liaoning Province, Anshan |
| Date Plant Established: | No. 1 Steelworks was built in 1935. No. 2 Steelworks was built in 1940. |
| Products: | Steel ingots and rolled steel products as listed in detail under "production". |
| Number of Employees: | See elsewhere in report. |
| Date Visited: | 12 and 13 June, 1946, by Messrs. Hurndall, Shaner, Elias, and Johnston, accompanied by Captain Fenical and Dr. Shao of the Northeast Chinese Economic Commission. |

## Steel Works (Nos. 1 and 2)

No. 1 Steelworks is housed in a building extending east and west on a site north of Nos. 5, 6, 7, and 8 blast furnaces. The principal equipment consists of one 600-ton mixer, three 300-ton tilting active mixers, four 100-ton basic open-hearth furnaces (tilting), two 150-ton tilting basic open-hearth furnaces, six soaking pit furnaces and the necessary charging machines, cranes, ingot strippers, ladles and ladle cranes, etc. From west to east in No. 1 Steelworks, the equipment is arranged in the following order: one 600-ton mixer, two of the three 300-ton tilting active mixers, the four 100-ton tilting basic open-hearth furnaces, the third tilting active mixer and finally the two 150-ton tilting basic open-hearth furnaces.

Hot metal from the blast furnaces is charged first into the 600-ton mixer and then into the active mixers. In the latter 170 kg of iron ore and 50 kg of lime per ton of metal also are added. After treatment in the active mixers, the metal is drawn off and charged into the open-hearths. Here the normal charge is about 85 per cent iron and 15 per cent scrap, the latter being almost entirely mill scrap. About 50 kg of lime, 150 kg of ore, 3 kg of fluorspar and varying amounts of mill scale per ton of steel also are charged into the open-hearths.

We were informed that the steelworks averaged a little more than two heats per day for the open-hearths in operation. A melt of about 160 tons per heat was reported on the 150-ton furnaces. However, considerable operating time must have been lost due to the short life of refractories. We were told that the average life of roof and backwalls was only 60 heats. The life of bottoms was reported as 2 years. Fluorspar for the open-hearth charge was obtained from Korea.

Of the six soaking pit furnaces, 4 are of the single type and 2 are of the gas burner type. Ingots were bottom-poured, about 5 tons in weight. Normally ingots remained in the casting pit about two hours and in the soaking pits three hours.

The No. 2 Steelworks is housed in a building west of No. 1 Steelworks. This building extends in a north-south direction. Its principal equipment consists of two 600-ton mixers, four 300-ton tilting active mixers, six 150-ton tilting basic open-hearth furnaces, the usual charging machines, cranes, ingot strippers and eight soaking pit furnace units--all of the gas burner type.

Arrangement of the equipment, from south to north, is as follows: two 600-ton mixers, two 300-ton tilting active mixers, four 150-ton tilting basic open-hearth furnaces, two 300-ton tilting active mixers, and two 150-ton tilting basic open-hearth furnaces. Practice in No. 2 Steelworks was similar to that in No. 1 Steelworks.

The capacity of Nos. 1 and 2 Steelworks is reported at various amounts ranging from 1,330,000 to 1,500,000 metric tons per year. Actual production never has mounted to anything approximating these capacities. According to information we believe to be reliable except as noted (because it was checked from independent sources) actual output of steel ingots was as follows:

| Year* | No. 1 Steelworks | No. 2 Steelworks | Total |
|---|---|---|---|
| 1935 | 211,560 | - | 211,560 |
| 1936 | 364,315 | - | 364,315 |
| 1937 | 516,349 | - | 516,349 |
| 1938 | 585,094 | - | 585,094 |
| 1939 | 529,606 | - | 529,606 |
| 1940 | 532,295 | - | 532,295 |
| 1941 | 561,372 | - | 561,372 |
| 1942 | 447,000 | 285,000 | 732,000 |
| 1943 | 430,000 | 414,000 | 844,000 |
| 1944 | | | 473,731** |
| 1945 | | | 150,000*** |

---

*Fiscal year is April-March, inclusive.

**Japanese at plant estimate output of both steelworks at 760,000 tons in 1944. Local records lost. Figure of 473,731 tons came from Tokyo.

***Estimate of Japanese at plant, April-August.

Removals.

No. 1 Steelworks shows no signs of removal of equipment. Inspection of No. 2 Steelworks shows absence of most of the key electrical and mechanical equipment. Plant personnel states the equipment was removed systematically by the Soviets. Included in the equipment removed were two 600-ton hot metal mixers, the tilting mechanism of the four 300-ton active mixers and of the six 150-ton open-hearth furnaces, four open-hearth charging machines (overhead type), seven large ladle cranes, seven cranes on charging side of open-hearths (one 5-ton, three 15-ton, each with 5-ton auxiliary hoist; two 14-ton and one 20-ton), four of five cranes over soaking pits, two ingot tilters and live-roll ingot conveyor.

From the foregoing, it is apparent that No. 2 Steelworks will be out of commission until such time as the important mixers, tilting mechanisms, charging machines, ladle cranes and other cranes, etc., can be replaced. Assuming that such equipment already built is available somewhere, the time required to get the plant in operation might be from six to twelve months.

No. 1 Steelworks is intact, but this important point should be kept in mind: this plant at one time operated on producer gas. When a mixture of blast furnace and coke oven gas became available, the steelworks changed to the use of this mixture and sold the gas producers. With no gas producers now at hand, resumption of operation of No. 1 Steelworks will depend upon ability to obtain blast furnace and coke oven gas.

Were this gas available, plus electricity, water and other services, No. 1 Steelworks could resume production of steel ingots on the same basis as prior to the end of the war. On the basis of capacity, this would mean the steelmaking facilities at Anshan could resume on a basis of about 40 per cent of wartime capacity. However, on a basis of actual production, the facilities could produce about 51 per cent of wartime output, because No. 2 Steelworks, although more recently built than No. 1, never equaled it in actual output.

## Rolling Mill No. 1

The Blooming mill ingots from No. 1 Steelworks go from the soaking pits to an ingot tilter to No. 1 Blooming mill. This is a 2-high mill with rolls 1100 mm. diameter x 2400 mm. long, driven by a 5260 horsepower motor. The mill is served by a bloom shear driven by a 120 horsepower motor.

Blooms rolled on this mill go to a 24-inch continuous mill and to an 18-inch continuous mill for reduction to billet size. The 24-inch mill consists of six stands of 2-high rolls 600 mm. in diameter x 1350 mm.

long. It is driven by a 4000-horsepower motor. The 18-inch mill consists of six stands of 2-high rolls 450 mm. diameter x 1100 mm. long. This mill also is driven by a 4000-horsepower motor.

Capacity of the No. 1 Blooming mill is reported to be 500,000 tons per year. Actual production is as follows:

| Year | Blooming Mill | 24 Inch Mill | 18 Inch Mill |
|---|---|---|---|
| 1938 | 580,000 | - | - |
| 1939 | 521,000 | 270,000 | 65,000 |
| 1940 | 532,000 | 290,000 | 63,000 |
| 1941 | 561,000 | 300,000 | 51,000 |
| 1942 | 390,000 | 300,000 | 50,000 |
| 1943 | 446,000 | 490,000* | 169,000 |
| 1944 | 429,000 | 480,000* | 168,000 |
| 1945 | (no data) | (no data) | (no data) |

Normally not all the blooms from No. 1 Blooming Mill go to the 24-inch and 18-inch mills. Part of the tonnage goes to the large bar mill for rolling into rails and shapes.

No. 1 Small Bar Mill Plant consists of a Roughing Mill of two stands of three-high rolls 450 mm. diameter x 1300 and 1000 mm. long and a Finishing Mill of five stands of three-high rolls 330 mm. diameter x 900 mm. long. Each mill is driven by a 1200 horsepower motor. The mills are served by a rotary shear, cooling bed, shear and inspection table.

Production of small bars and wire rods from this mill totaled 75,000 tons in 1942 and 79,000 tons in 1943. No data was available for 1944 and 1945 when our inspection was made.

## Removals.

There were no removals of equipment from No. 1 Blooming Mill and No. 1 Small Bar Mill. However, the latter was partially dismantled but is on the premises and could be assembled.

## Rolling Mill No. 2

No. 2 Blooming Mill received ingots from No. 2 Steelworks. It is a 2-high mill with rolls 1100 mm. diameter x 2400 mm. long. It is driven by a 7000-horsepower motor. It is served by a bloom shear and hot bed, from which blooms go to a 24-inch continuous billet mill. This mill consists of six stands of rolls 600 mm. diameter x 1350 mm. long, driven by a 5000-horsepower motor. The capacity of these mills is rated at 500,000 tons per year. Actual production is reported as follows:

---

*In 1943 and 1944 some blooms were supplied this mill from No. 2 Blooming Mill.

| Year | No. 2 Blooming Mill | 24-Inch Billet Mill |
|---|---|---|
| 1943 | 280,000 | 84,000 |
| 1944 | 380,000 | 114,000 |
| 1945 | (no data) | (no data) |

A mill which the plant personnel designates as "Large Bar Mill" is a rail and structural mill consisting of a stand of 3-high rolls 780 mm. diameter x 2100 mm. long. The mill is driven by a 4000-horsepower motor. It is served by a heating furnace for heating incoming blooms or billets, hot saw, cooling bed, eccentric press and an end milling and drilling machine for machining the ends of rails.

Actual production on this mill is reported as follows:

| Year | Rails | Seamless Tube Blanks | Bomb Blanks | Shapes | Total |
|---|---|---|---|---|---|
| 1939 | 86,000 | 25,000 | 8,200 | - | 119,200 |
| 1940 | 80,000 | 39,000 | 10,000 | - | 129,000 |
| 1941 | 80,000 | 29,000 | 13,000 | 3,700 | 125,700 |
| 1942 | 95,000 | 29,000 | 3,000 | 9,400 | 136,400 |
| 1943 | 88,000 | 37,000 | 1,000 | 5,100 | 131,100 |
| 1944 | (no data) | (no data) | (no data) | (no data) | (no data) |
| 1945 | " | " | " | " | " |

No 2 Small Bar Mill Plant consists of heating furnace, a roughing mill (two-high), a roughing mill (three-high), a double stand of two-high rolls, rotary shear and cooling beds, etc. Rolls of the two-high roughing mill are 530 mm. diameter by 600 mm. long and are driven by a 150 horsepower motor. Rolls of the three-high roughing mill are 470 mm. diameter by 1000 and 700 mm. long and are driven by a 1200 horsepower motor. The double two-high rolls are 365 mm. diameter by 550 mm. long and are driven by a 2200 horse-power motor. This mill plant is provided with necessary equipment for handling skelp, wire rods, and small bars.

Actual production is reported as follows:

| Year | Skelp | 5.5 MM Wire Rods | 9 MM. Wire Rods | Total |
|---|---|---|---|---|
| 1943 | 24,000 | 33,000 | 10,000 | 67,000 |
| 1944 | 21,000 | 40,000 | 14,000 | 75,000 |
| 1945 | (no data) | (no data) | (no data) | (no data) |

The "Medium Plate Mill Plant" consists of a 3-high plate mill. The center roll is 600 mm. in diameter and top and bottom rolls are 800 mm. in diameter. All are 2100 mm. long. The mill is driven by a 2380 horsepower motor. The plant was well-equipped with continuous heating furnace, hot leveler, cooling beds, trimming shears, normalizing furnaces, cold leveler, etc.

Actual production was reported as follows:

| Year | Medium Plate |
|---|---|
| 1942 | 19,000 M. Tons |
| 1943 | 59,000 " " |
| 1944 | (no data) |
| 1945 | " " |

The "Thin Plate Mill Plant" consists of a heating furnace for heating sheet bars, two stands of hot rolls 710 mm. diameter x 1180 mm. long, heating furnace, a stand of finishing rolls, heating furnace, another stand of finishing rolls, shear, a stand of cold rolls, annealing furnace, cooling bed and inspection table. This is a modification of the hand sheet mill of the United States.

Actual production was reported as follows:

| Year | Sheets |
|---|---|
| 1939 | 42,000 M. Tons |
| 1940 | 42,000 " " |
| 1941 | 37,000 " " |
| 1942 | 36,000 " " |
| 1943 | 35,000 " " |
| 1944 | (no data) |
| 1945 | " " |

## Removals.

Practically all of the mechanical and electrical equipment for No. 2 Blooming Mill and its attendant 24-inch continuous Billet mill, "Large Bar Mill" (rail and structural mill), No. 2 Small Bar Mill, Medium Plate Mill, and Thin Plate Mill (Sheet Mill) has been removed. Plant personnel state removal was made by the Soviets. In addition another small bar mill was reported taken by the Soviets. This mill had been ordered from Germany by the Japanese who were operating the Anshan works. Shipment of the mill was delayed so long that the Japanese obtained a similar mill from Japan and erected it. After it was in operation, the long-delayed mill from Germany was received. It remained crated and was reportedly taken away by the Soviets along with the other mill equipment.

## Remarks.

The removal of so much important rolling mill equipment and accessories will cripple the finishing capacity of the Anshan works severely. No. 1 Blooming Mill and No. 1 Small Bar Mill remain. Gone until large-scale replacements can be made are capacities for rails, shapes, plates, and sheets. The loss of the "Large Bar Mill"--rail and structural mill--is particularly unfortunate. This was the most versatile mill in the plant and its products seem to be in demand in this area. Structural shapes for bridge and building construction and rails for railroads should be in active demand for years to come.

By assembling the small bar mill and using it to reduce billet mill, the plant will be able to turn out small shapes, bars, wire rod, etc. This probably would not amount to more than 15 or 20 per cent of the steel tonnage rolled before the removals took place.

The removal of finishing equipment tends to further unbalance the production facilities at Anshan. Before the end of the war, The Manshu Iron Company was top-heavy on pig iron and steel ingot capacity and deficient in facilities for rolling finished steel products. Although blast furnace operations temporarily or for an extended period will be curtailed sharply at Anshan, there is also potential pig iron capacity at Penchihu and possibly at the Tohendo works (we were not able to inspect this).

Thus, there remains the problem of finding or developing export markets for surplus pig iron (especially low phosphorus iron) and/or installing more finishing capacity. The decision in these matters would seem to rest largely upon the peacetime need for finished rolled steel in areas that can be served economically from Anshan.

PREPARED BY

Earl L. Shaner

# MANSHU IRON COMPANY, LTD.

**Location:** Anshan, Liaoning Province

**Date Visited:** 12 and 13 June, 1946, by Messrs. Hurndall, Shaner, Elias, and Johnston, accompanied by Captain Fenical and Dr. Shao of the Northeast Chinese Economic Commission

-

## Chemical Department

### By-Product Coke Oven.

This is the section of the Manshu Iron Works which produces coke and recovers by-products, the coke being used for the production of iron in the blast furnaces and the coke oven breeze being used in producing sponge iron (Luppe) and in sintering of the iron ore.

Four blocks of coke ovens are installed in the plant as follows:

Block No. 1 is a Koffers installation; consists of 5 batteries containing a total of 216 ovens.

Blocks 2, 3, and 4 each consists of 4 batteries containing a total of 216 ovens. These are Otto installations.

Blocks 1 and 2 were left intact. They have a charging capacity of 1270 tons per day and 2780 tons per day, respectively. Blocks 2 and 3 had all the corollary equipment removed although the coke ovens themselves were left intact. These had a charging capacity of 2780 tons per day each. Assuming the ovens themselves to represent 50 per cent of the capital equipment, the removals of such equipment from these installations amount to roughly 25 per cent and the reduction in capacity to 57 per cent. In other words, 43 per cent of the original capacity is now available without further repairs. On replacement of the auxiliary equipment taken from the two blocks, the entire capacity can be restored.

Besides the coke and coke oven gas itself, by-products were recovered from the gas. There were 3 by-product recovery units. No. 1 handled 420,000 cu. m., No. 2 had two lines, one handling 611,600 cu. m., and the other 1,223,200 cu. m.; No. 3 handled 917,400 cu. m. Of these, major removals of about 75 per cent of the necessary equipment were made in that line of the No. 2 recovery unit which handled 1,223,200 cu. m. and also in the No. 3 unit handling 917,400 cu. m. The capacity for by-product recovery was therefore reduced from 3,182,200 cu. m. to 1,031,600, leaving only 30 per cent of the previous capacity. The removals of capital equipment including washing columns, condensers, receivers, auxiliary stills, saturators for ammonium sulfate, ammonia stills, compressors, etc., amounted to about 75 per cent of the equipment in each of two units handling 70 per cent of the capacity, so that the capital goods removals are estimated at·approximately 53 per cent of the total recovery equipment.

The products of the recovery system are crude benzol, ammonium sulfate, and tar. The existing capacity for these products has been reduced to 30 per cent of its original capacity so that if power were to become available the production would be as follows:

| Product | Original Capacity (Metric Tons per Day) | Present Capacity (Metric Tons per Day) |
|---|---|---|
| Crude Benzol | 120 | 36 |
| Ammonium Sulphate | 120 | 36 |
| Tar | 401 | 121 |

Ammonium sulphate is an end product used in Manchuria chiefly as a fertiliser.

Benzol Refining Plant.

From the crude benzol, various products have been produced. These were as follows:

Naphtha, going chiefly to Manchurian customers for use as a solvent in the rubber industry, 2.3 tons per day.

Motor benzol, also chiefly for Manchurian use as a motor fuel and solvent, 16.1 tons per day.

Xylol, going to Manchuria and Japan chiefly for use as a solvent, 1.15 tons per day.

Pure toluol, to Liaoyang Arsenal for TNT production, 9.2 tons per day.

Pure benzol, to Manchuria and Japan for dye-stuffs, explosives, etc., 55.2 tons per day.

The essential parts of the crude benzol refining plant were removed by the Soviets according to Mr. Chang and his associates. Inspection of the plant showed that the columns and heating units of 12 vertical stills out of 14 had been removed although the still bodies were left intact. Two whole stills were left intact. The condensers and receivers for these 12 stills were also missing and a number of liquid handling pumps had been removed. It is estimated that 25 per cent of the capital equipment had been removed. However, the capacity without this equipment was nil.

Tar Plant.

There were two units for distilling products from the coal tar. One, stated to have a capacity of 234 T/day, was completely removed and the other with a capacity of 150 T/day was left behind untouched. The tar distillation capacity was therefore reduced to about 30 per cent of its original figure.

The products produced from the tar included raw anthracene, raw naphthalene, pitch, and creosote.

The only unit installed for purifying raw naphthalene to give 10 tons per day of pure naphthalene was largely removed. Similarly, the phenol refining unit producing 10 kg/day of pyndine, 0.2 T/day of phenol, 1 T/day of cresol, 0.2 T/day of xylenol, and 91 T/day of creosote oil from the creosote fraction was also removed. These products are used for antiseptics, plastics, wood preserving and pharmaceutical products. The pure naphthalene went to chemical plants in Japan and Manchuria. None of these can now be produced without replacement of the units removed.

The following table summarizes the effect of Soviet removals on capacity and on capital value:

| | % of Original Capacity Left | % of Capital Equipment Removed |
|---|---|---|
| Gas & coke production | 43 | 25 |
| By-product recovery | 30 | 53 |
| Benzol refining | 0 | 25 |
| Tar distillation | 30 | 70 |
| Phenol Plant | 0 | 90 |
| Sulphuric acid | 0 | 30 |

The following related material is located in Source File 2-A-1:

1. Table showing sources and consumption of coal used, yield of coke from each, mixing ratio to obtain the charging mixture, analysis of charging coal, and production of the various products on recovery and refining. Also production of sulphuric acid, made here for ammonium sulphate production. The maximum production of sulphuric acid was in 1942 when 33, 102 metric tons of 50° Be sulphuric acid was produced and 2516 tons of 66° Be acid. Carbon black and pitch coke were also produced for use in making electrodes. Pitch was also produced for briquetting coal in various Manchurian plants.

2. Flow sheet showing capacities of the various units.

3. Estimate made by Dr. I. Ohno, a Japanese technician now in

charge of this plant, of the capacities before and after removal.

4. List of products of the plant and their eventual destination and use. The plant for coke ovens and by-products occupies about 500,000 cu. meters.

The employees were 2800 in number of whom 1100 were Japanese and 1700 Chinese, with a staff of 20 Chinese and 250 Japanese.

Sulphuric acid was produced in a tower system of the chamber type using sulphur imported from Japan. Due to the removal of pumps and auxiliary equipment, no sulphuric acid can be produced until this is replaced. It is estimated that 30 per cent of the capital equipment was removed.

PREPARED BY

N. M. Elias

## SUMITOMO METALLURGICAL COMPANY

Location: Liaoning Province, Anshan. Plant is adjacent to Manchu Iron Co., Ltd. Anshan plant, north on line through No. 9 Blast Furnace and Roll Turning Shop.

Products: Seamless tubes and tubular products, such as cylinders for cutting and welding gases.

Description of Principal Equipment: This plant was inspected by Messrs. Hurndall and Shaner on June 13, 1946, accompanied by H. H. Shao of Northeastern Chinese Economic Commission and local Chinese and Japanese former plant personnel. The plant was engaged in producing seamless steel tubing by the Stiefel and Crankpress processes. The principal equipment consisted of a metallurgical laboratory, a Stiefel mill and accessory equipment and a crankpress mill and accessories.

Inspection at this plant was difficult because of extensive removals. Everything in the laboratory had been removed. All major equipment employed in both methods for producing seamless tubes had been removed. A railroad spur had been run into the plant to facilitate removal of equipment. Local plant personnel attributed all removal to the Soviets. They also stated that the Soviets took 577 tons of finished seamless tubes. About 300 tons of finished seamless tubes remain in stock. It was estimated that the large stock of seamless tube blanks on hand amounts to 7,000 tons. These blanks are shipped to Sumitomo from the large bar mill of the Anshan works of Manchu Iron Co., Ltd.

It was stated that this plant, as of August 15, 1945, had an annual capacity of 56,000 tons of seamless tubes.

Removal of major equipment reduces the productivity of this plant to zero. No tubes can be produced until mills are installed.

PREPARED BY

E. L. Shaner

## SHINKO METALLURGICAL COMPANY

Location: Anshan. North of Central section Manchu Iron Co.

Date Visited: 13 June 1946 by Messrs. Einig & Taylor

Source of Information: Japanese who was the former director of the Anshan Steel Works.

Product: Steel castings, hydraulic presses, briquetting presses, forgings, small tools (milling cutters, twist drills, etc.) shovels for Jones shovels, heavy machine work.

Source of Raw Material: Manchu Iron Works for iron and steel.

Source of Power: Primary Station (Anshan) Manchuria Electric Co.

Power Requirement: 2500 kw (Normal operation)

Number of Employees: 400 (1942) (In machine shop only)

Distribution of Product: Manchu Iron Works and Dairen.

Raw Material on Hand: Large stocks of ingots, blooms, bars and billets. No high speed steel.

Equipment: This plant consists of a heavy machine shop, forge shop and a plant for the manufacture of cutting tools such as milling cutters, twist drills, etc. for their own use and the remainder was sent to Dairen. The equipment in the main machine shop included the following:

2—72" Sunderland Gear Generators
1—10' Betts Vertical Forging and Turning Mill
1— 6" Bar Floor Type Horizontal Boring Mill
1—36" x 12' Operator Planer
1—6 3/4" Bar Blocktruck and Harvey Floor Type Horizontal Boring machine
1—6'—17" Column Fordeck Radial Drill
1—96" x 20' Lathe with Adjustable Bed
7—50" Swing Facing Lathes (Horizontal)
1—24" Shaper
41 Heavy 24" x 8' Center Belt Drawn Engine Lathes
3 Table Type 4" Bar Horizontal Boring Machines
1—72" Gould and Ekrharst Horizontal Type Generator
1—72" Hobbing Machine
2—24" Level Gear Planers
1— 5' Plain Radial Drill

1 Heavy Drawing Wheel Lathe
5 Planers 36" to 72" between Housings
5 Slotters from 12 to 24" strope
4—4½ Floor Type Horizontal Boring Machines
4—42" Vertical Boring and Turning Mills
13 Traveling Cranes Maximum Capacity 30 Tons

All equipment motor driven exceptions mentioned.

Soviet Removals: Removed by Soviets from this department:

1—60" Vertical Boring and Turning Mill and
1—50" Vertical Boring and Turning Mill
1— 6' Plain Radial
1—Vertical Milling Machine

Total number of machine tools 231 in place.

This is a well equipped shop and could readily be placed in operation with current available for the motor driven equipment, belts and the necessary cutting tools.

In 1944 a new shop was built for the manufacture of cutting tools including milling cutters, twist drills and framers, etc. This plant was finished in December of 1944 with a floor space of 2,100 square meters semi air conditioned and provided with the latest type of motor driven machine tools, measuring instruments, braid twisting equipment, etc. The total number of machine tools was 70 and the total number of equipment units including machine tools was 90.

The number of workmen was 130.

The high speed steel came from Dairen.

The cutting tools were made for the use of the general requirements of the entire plant and the remainder were sent to Dairen for distribution to Army and Navy contractors.

This entire plant was removed by the Soviets and only the bare building remains.

The Steel Foundry occupies a brick and steel truss building of 4,500 square meters and employed 800—1,000 men. The equipment includes the following:

1 three ton Electric Arc Furnace
1 two ton Electric Arc Furnace
2 fifteen ton open hearth furnaces with maximum capacity of charge of 22 tons each castings up to 28 tons can be made.

Nothing was removed by the Soviets but the crane motors were taken by Chinese mobs. This foundry could start operations in a few months required for general repair.

The Forge Shop is housed in a brick and steel truss building of 2,000 square meters employed 200 workmen and has the following installed equipment:

1--3 Ton Double Framer Steam Hammer
1--1/2 Ton Open Framer Steam Hammer
1--2,000# Steam Shop Hammer
3--3,000# Steam Flatter Forging Hammer
1--500 Ton Hydraulic Forging Press
3 Traveling Cranes of Maximum Capacity of 15 Tons

Furnaces are coal fired.

No equipment was removed by the Soviets but the crane motors were taken by mobs.

In the yard was a supply of several hundred tons of forging ingots, blooms and billets. Plant could readily be put in operation with a supply of steam and electricity. Steam from 3 Lancashires boilers.

Total equipment taken from this plant by the Soviets:

4 Machine Tools from main machine shop

Entire cutting tool installation of 70 machine tools and other auxiliary equipment amounting to a total of 90 items.

Removal figures are based on statements of former Japanese and present Chinese officials.

Reduction in capacity by removals; small tool plant 100 per cent remainder of plant capacity reduced 10--20 per cent.

PREPARED BY

A. B. Einig

## JAPAN PIPE COMPANY

Location: Liaoning Province, Anshan. This plant is directly north of the coke oven plant of Manchu Iron Co., Ltd. at Anshan.

Date Established: 1935 capital Yen 5,000,000

Products: Butt-weld steel pipe from 1/2 to 2 inches in diameter.

Description of Principal Equipment: The plant was inspected on June 13, 1946 by Messrs. Shaner and Hurndall, accompanied by Mr. H. H. Shao and local Chinese and Japanese former plant personnel. The principal equipment included one skelp furnace and one set of tube drawing equipment and the conventional accessories.

Skelp in sizes ranging from 1/16 x 1-5/8 inches to 1/4 x 6-1/6 inches was shipped to this plant from the small bar mill of the nearby Anshan Iron Works, Ltd. After heating in the skelp furnace to proper temperature, it is drawn through a bell-shaped die having an opening of the exact size of the outside of the finished pipe. This bends the heated skelp into form and at the same time exerts sufficient pressure so that the butt ends of the skelp fuse together into a welded joint as they pass through the die.

After welding the tubes are made round by passing them through a set of sizing rolls and are straightened by passing them through straightening rolls.

Plant personnel stated the capacity of the plant was 2,500 tons of 1/2 to 2 inch butt-weld pipe per month when the plant was operating 24 hours per day. Another report by Chinese officials gives the annual capacity as of August 15, 1945 as 5,700 tons. This same source reports removals by the Soviets of 206 "machines and parts", representing 25 per cent of the original equipment and causing a reduction in productive capacity of 30 per cent.

Inspection revealed the absence of some equipment, but it is believed this plant could operate immediately at about 75 per cent of average wartime production when electricity and other services are restored. The additional 25 per cent of capacity probably could be restored in 3 to 6 months time if equipment already built could be obtained from other areas in the Far East for replacement purposes.

PREPARED BY

E. L. Shaner

## ANSHAN STEEL FABRICATION COMPANY

Location: Liaoning Province, Anshan. Plant adjoins property of Manshu Iron Co., Ltd. and is north of Roll Turning Shop.

Date Established: 1934

Products: Bars, shapes, rails and fish plates as shown in greater detail under "production".

Description of Principal Equipment: This plant was inspected by Messrs. Hurndall and Shaner on June 13, 1946, in company with Mr. Hua Hsiang Shao and local plant personnel.

From the name of the company your inspectors expected to find a structural steel fabricating shop. However, no fabricating is performed in this plant. The company operates a bar mill and its products consist solely of the bars, rails, shapes and fish plates rolled on this mill.

The mill, which is driven by a 2000-horsepower motor, consists of four stands, three of which are 3-high and one 2-high. The rolls are 580 mm. in diameter and 1700 mm. long. Material for rolling comes from the Anshan Iron Works, Ltd., plant in the form of 90 mm. square billets.

Average output before the end of the war, as reported to us by Chinese and Japanese former plant personnel was 4000 tons monthly, consisting of angles from 50 to 100 mm., rails from 8 to 15 kg. per meter, round bars from 32 to 50 mm. diameter and fish plates for 50 kg. rails.

From information received from another source production from 1941 to 1945, inclusive, by years, was as follows: (metric tons)

| Year | 1941 | 1942 | 1943 | 1944 | 1945 |
|---|---|---|---|---|---|
| Angles | 23,012 | 20,324 | 26,047 | 31,815 | 24,633 |
| Round Bars | 9,936 | 6,273 | 4,836 | 19,804 | 11,836 |
| Flat Bars | 2,470 | 3,422 | 2,239 | 4,137 | 4,132 |
| Square Bars | 0 | 1,956 | 1,847 | 3,247 | 5,291 |
| Rails | 23,520 | 29,036 | 23,279 | 32,778 | 16,455 |
| Fish-plate | 6,154 | 4,485 | 5,561 | 8,303 | 3,111 |
| TOTALS | 65,092 | 65,496 | 63,809 | 100,084 | 65,458 |

Examination of this plant revealed no important removal of equipment. Plant personnel claims that the Soviets removed office furniture, a number of motor trucks, 30 tons of angles and 30 tons of round bars, plus some miscellaneous machines and equipment.

A report of removals by local plant personnel, Source File 2-A-5, is seemingly at variance with a tabulation made by the Chinese Economic Commission showing that 229 "machines and parts" were removed by the Soviets. This report states these removals constituted 20 per cent of the original equipment and reduced the productive capacity of the plant by 45 per cent.

From our inspection, which admittedly may have been too superficial because of lack of time, we would be inclined to question this 45 per cent reduction as being on the high side. With some moderate replacement of not-too-difficult-to-obtain equipment and with the restoration of electricity and other normal services, this plant could be restored to average wartime output in three to six months.

PREPARED BY

E. L. Shaner

## KUKOTU IRON PIPE COMPANY, LTD.
### (Also Manchuria Kubota Cast Iron Pipe Company, Ltd.)

Location: Liaoning Province, Anshan

Products: Cast iron pipe, pipe fittings and general castings

Description of Principal Equipment: This plant was inspected by Messrs. Hurndall and Shaner on June 13, 1946, in company with Mr. Hua Hsiang Shao of the Northeast Chinese Economic Commission and local plant personnel.

Equipment for casting pipe consists of five shops for casting pipe vertically and two shops for casting pipe centrifugally. Also there is a foundry for making general castings and pipe fittings, a machine shop, pattern shop, forging shop, repair shop, mold shop and necessary auxiliaries.

No. 1 vertical pipe shop casts pipe up to 900 mm. in diameter. No. 2 vertical pipe shop casts pipe from 300 to 350 mm. in diameter. Each of these shops is supplied with metal from a 7½-ton cupola. The output of Nos. 1 and 2 shops totals about 10 tons daily.

No. 1 Centrifugal Pipe Shop casts pipe from 200 to 250 mm. in diameter. It has 3 centrifugal machines revolving at about 850 revolutions per minute. Hot metal is supplied by two 7½-ton cupolas. Normal output is about 25 tons per day.

No. 2 Centrifugal Pipe Shop casts pipe 600 mm. in diameter. It consists of two centrifugal casting machines which operate at about 640 revolutions per minute. Normal output is 30 tons per day. Hot metal is supplied by two 7½-ton cupolas.

No. 3 Vertical Pipe Shop casts pipe 150 mm. in diameter. Its normal output is 10 tons per day. No. 4 Vertical Pipe Shop casts pipe 100 mm. in diameter. Its output also is 10 tons per day. Two 10-ton cupolas supply metal for Nos. 3 and 4 Vertical Pipe Shops.

No. 5 Vertical Pipe Shop casts 900 mm. diameter pipe. It is served by two 10-ton cupolas and has a daily output of 15 tons.

A foundry for general castings is served by two 7½-ton cupolas. This foundry specializes in ingot molds, containers for chemicals, pipe bends and other fittings, etc. Many of the larger chemical castings are pit-molded, the sweep method being used in building up the molds. The machine shop, pattern shop, forging shop, repair shop, core department, etc. all were of conventional character with no distinctive methods or equipment.

Cast iron pipe and general castings made in this plant seemed to be of good quality--clean in appearance and of dense structure. The principal consumers of cast iron pipe produced in this plant, in order of tonnage consumed, are as follows:

1. South Manchurian Railway
2. Manchu Iron Company, Ltd.
3. The government (principally for military use)
4. Municipalities

According to information supplied us by plant personnel, equipment removals and damage to plant or contents were rather spotty and erratic. It was claimed that Soviets carried away 1,000 tons of pig iron, the motor from a 3-ton overhead yard crane, the motor for a sand mixer, 2 grinding machines for finishing the ends of pipe, the motor for one of the vertical casting machines, 2 overhead crane motors, 300 tons of finished pipe, 2 woodworking lathes, a woodworking planer and circular saw, two blowers, one $\frac{1}{4}$-ton pneumatic hammer, one welding machine, 2 air pumps, a portable grinder and some equipment in the core repair shop. A number of rammers are missing from No. 2 Vertical Pipe Shop. The motor of No. 2 Centrifugal Shop is reported damaged by removal of brushes and other items.

A transformer station was damaged by what appeared to be vandalism. Our informants stated this was done by the Communist Chinese Army. The Communists also were charged with having torn up the wood floor of the pattern shop and with tearing down the forge shop building.

However, in the main this cast iron shop has not suffered severely. With electricity restored, a few key motors replaced, electrical wiring and equipment repaired and a few smaller machines replaced it could operate at 80 per cent or more of its wartime production, providing demand for the product warranted this rate of output.

On June 13, 1946, when our inspection was made, the stock of finished pipe in standard sizes on hand was estimated at 4,000 tons.

PREPARED BY

E. L. Shaner

# MANCHU WIRE ROPE COMPANY, LTD.

Location: Liaoning Province. About 4 miles northeast of center of Anshan (this plant rather isolated and remote from other industrial sections of Anshan).

Products: Wire rope, stranded wire and plain galvanized wire.

Description of Principal Equipment: This plant was inspected by Messrs. Hurndall and Shaner on the afternoon of June 13, 1946, accompanied by Mr. Hua Hsiang Shao and local plant personnel. Practically all of the equipment is of orthodox design and construction of about 25 years ago in the United States. Principal equipment consists of preheating and annealing furnaces for the incoming wire rod (which is shipped from the No. 2 Steel Works of the Manchu Iron Works, Anshan), pickling tanks, liming and drying apparatus, 224 iron benches, 70 stranding machines for wire, 22 stranding machines for cotton or hemp centers for wire rope, a very small laboratory, annealing furnaces, die shop, galvanizing bath (dip process), repair shop, transformer station and 3 small heating boilers.

We were surprised to find that (according to our informants) only one grade of steel in wire rod form is used in this plant. Whereas in most wire rope plants, four to ten grades of steel are used, here the rods obtainable seemed to be only ordinary carbon steel from Anshan. These rods are received in diameters ranging from 5 to 7 mm. They are drawn down to desired gauges of wire, stranded and formed into wire rope. The maximum diameter of wire rope made in this plant is 60 mm. This rope consists of 6 strands of 19 wires each.

Most of the wire rope manufactured in this plant is consumed in the mining industry. Stranded wire is consumed chiefly for guying telephone and telegraph poles, small smokestacks, etc.

Average monthly output just prior to the end of the war was as follows:

| | | |
|---|---|---|
| Wire rope | 264 | M.T. |
| Stranded wire | 3.5 | |
| Galvanized wire | 50 | |
| Total | 317.5 | M.T. |

According to Chinese and Japanese former plant personnel, 10 officers of the Soviet government were quartered in the plant for two months from mid-September to mid-November, 1945. According to the same informants, the Soviets removed from the plant during this period the following equipment and supplies and products:

| | |
|---|---|
| 1 - | 25-horsepower motor |
| 1 - | 20 " " |
| 3 - | 10 " " |
| 21 - | 7½ " " |
| 77 - | Motors of 5 or less horsepower each |
| 69½ - | tons finished wire rope |
| 2½ - | " stranded wire |
| 9 - | " galvanized wire |
| 24 - | " wire rods |
| 15 - | " cotton yarn for centers of wire rope |

The informants also said that 21 carloads of wire rope (approximately 650 tons) were loaded and about to be taken by the Soviets, but at the last moment were left behind. This rope later was sent to the Anshan Iron Works for storage. Our informants stated some machines were removed from the repair shop, but upon investigation it is clear that these removals consisted merely of some cutting tools, portable grinders, etc. Easy-to-take items such as chain blocks, small lathes, shapers and drill presses apparently were not molested or taken. A small transformer station seemed to be in perfect order. Three small heating boilers remained intact. In a small laboratory a Leitz Metallurgical microscope appeared to be unharmed.

Our informants had no explanation as to why this plant escaped with minor damage--either by removal of equipment or by sabotage by Communist army or undisciplined mobs--compared with that suffered by other plants around Anshan, except the assumption that the plant is "out of the way" or remote from the larger industrial section. An explanation which occurred to us as we inspected the plant was that the equipment is not modern and therefore may not have seemed desirable to the Soviets.

With the replacement of certain motors and the restoration of electric power in the area, this plant could resume operations almost immediately. A stock of about 600 tons of wire rod is on hand. All dies for the wire drawing blocks have been stored. A sufficient number of dies are available to keep the plant going at capacity for six months. Manganese steel for dies in the past was obtained from the special steel companies at Penchihu and Dairen.

PREPARED BY

E. L. Shaner

## ANSHAN GALVANIZING COMPANY

Location: Anshan

Date Visited: 13 June 1946 by Messrs. Johnston & Elias

Date Put in Operation: June 1938

Description of Product: Galvanized sheet iron, plain and corrugated. Plain and galvanized wire, barbed wire. Nails, plain only.

Best Previous Production and Year (or capacity):

| | | | | | |
|---|---|---|---|---|---|
| Capacity: | Nails (not galvanized) - | 300 | tons | per | mo. |
| | Wire " " | 150 | " | " | " |
| | Wire (galvanized) | 40 | " | " | " |
| | Sheets " plain | 40 | " | " | day |
| | Sheets " corrugated | 10 | " | " | " |

Outline of Plant Equipment: Plant is divided into two parts, one part for sheets and one for wire and nails. Equipment in sheet department consists of vats for pickling, zinc dip furnace and vat, and rolls for corrugating. In the wire department equipment consists of scaling machine, annealing furnace, drawing dies, pickling vats, spools and barbed wire machines. As part of the wire department there is a room with nail cutting machines and tumbling barrels.

Number of Employees at Full Operation: 162 workmen and 28 staff - 190 total.

Removals: Inventory of plant equipment is listed as follows:

| MACHINE | ORIGINAL | REMOVED | DAMAGED | REMAINING |
|---|---|---|---|---|
| Nail Machines | 66 | 4 | 36 | 26 |
| Tumbling bbls. | 12 | - | 3 | 9 |
| Wire Drawing | 141 | - | 30 | 111 |
| Barbed Wire | 2 | - | 2 | - |
| Annealing furnaces | 7 | - | 1 | 6 |
| Galvanizing furnaces | 1 | - | 1 | - |
| Elect. Spot Welders | 5 | - | 2 | 3 |
| Galvanizing Pots | 2 | - | 2 | - |
| Machine Tools | 9 | - | 8 | 1 |
| Tensile strength mach. | 1 | - | 1 | - |
| Torsion test machine | 1 | - | 1 | - |

Removals and damage were by mob and not credited to the Soviets. Approximately 600 tons of stock were removed.

Destruction: Besides the damaged equipment listed under Removals, most of the buildings were roofless, all doors and windows broken or removed and in general the plant was a sad state of repair.

Maximum Capacity Considered Practical to Restore: Full capacity.

Equipment Needed for this Restoration: Four nail machines. Rest can be repaired and used. Materials such as lumber, glass and sheeting needed to put buildings in order to protect remaining equipment that is deteriorating.

Source of Raw Materials: (a) Previous. Sheets and rods from Anshan Steel Works. Zinc imported from Japan. Acid locally. (b) Future. Sheets and rods from local steel plant when restored. Zinc from local refinery in Mukden. Acid from various Manchurian producers.

Stockpiles: (a) Raw materials - none (b) Finished products - none.

Former Distribution of Product: All products turned over to Manchurian Trading Company on contract basis.

Immediate Future Demands for Product: Galvanized sheets, wire and nails are all urgently needed in rebuilding destroyed property. The full capacity of this plant will be required continuously.

Former and Present Plant Managers: Former, unknown; present, Mr. Odono.

Names of Soviet Officials Handling Removals: Not known.

Notes on Process: Sheet iron, cut to size (3' x 6' x 30 gauge) was received from the rolling mills, dipped in 5 per cent sulfuric acid solution, then ammonium chloride solution, drained and then dipped in first a molten lead bath followed by a molten zinc bath giving a coating of lead and zinc equal to 5 per cent of the weight of the sheet. 100 pounds of zinc were used per ton of sheets. About 20 per cent of the galvanized sheets were corrugated in 2 sizes. All handling of sheets through the steps of processing was done by manpower. No overhead cranes or labor-saving devices were used.

Wire rods 5.5 mm. in diameter were received from the rod mill of the steel works and first put through a scaling machine and then an acid and a lime dip respectively. Drawing to desired sizes was done cold through tungsten steel dies one size at a pass. The drawn wire was then passed through an annealing furnace where it was heated to dull red, then to hydrochloric acid, water and zinc chloride dips before the final dip into the galvanizing pots. The final galvanized wire was rolled on spools 450 kg. each.

Barbed wire was made by passing the plain wire through one of two barbed wire machines, one German and one Japanese design.

Nails were made in individual nail machines from rods drawn to 8, 10, 12, 14, 16, 18, 20 and 22 gauge. Nails from 1/2" to 7 inches were made, none were galvanized.

Remarks: While this plant has the appearance of being in a disrupted state, it can be restored to a production status with no real difficulty. Repairs to the buildings would be the first step.

Raw materials (sheets, rods and zinc) will be required and since these will probably come from the steel rolling mills, operation of this plant will be delayed until materials can be obtained.

PREPARED BY

T. L. Johnston

## KODOKU MACHINE WORKS

**Location:** Anshan

**Date Visited:** 13 June 1946 by Messrs. Johnston & Elias

**Date Put in Operation:** 1938

**Description of Products:** Iron and steel castings, steel forgings, small machined parts.

**Best Previous Production and Year (Capacity):** Not known, see following notes for explanation.

**Outline of Plant Equipment:** Small foundry equipment for making cast iron castings. Electric furnaces and steel casting shops. Machine shop with about 40 machine tools of small size. Reheating furnace and small rolling mill.

**Number of Employees at Full Operation:** 140

**Removals:** None

**Destruction:** None

**Maximum Capacity Considered Practical to Restore:** Full capacity

**Equipment Needed to Restore:** None

**Source of Raw Materials:** (a) Previous. Local scrap and coal. (b) Future. Local scrap and coal.

**Stockpiles:** (a) Raw materials - about 20 tons of scrap near furnaces. (b) Finished products - 5 tons.

**Former Distribution of Products:** Various departments of Anshan Steel Works.

**Immediate Future Demands for Product:** Small castings for restoring large units in steel plant can be made at this plant.

**Former and Present Plant Managers:** Former, unknown; present, H. Chio.

**Soviet Official Handling Removals:** Nothing removed

Notes on Process: This plant is more of a joober foundry independent of the general steel works but supplementary in that it makes small plain castings and machines some of the castings.

The electric arc furnaces were used for melting steel scrap which was then molded into steel castings. Small ingots were also made, they were rolled in a two high, 4 stand set of rolls producing rods of various sizes.

The machine shop contained about 40 machine tools including lathes, drills and shapers for finishing the castings. Many of these castings were made for equipment used at the iron mines.

Two small cupolas were used for melting pig for use in making ordinary cast iron.

Remarks: Nothing of importance has been removed from this plant although there are machine tools and electric furnaces which are usually items removed from such plants.

The Communists (8th Army) is said to have used part of this plant for quarters and used the foundry to make some small castings in the form of cups which were used as hand grenades.

Given electric power this foundry and shop could resume work at any time. It can be of considerable assistance in making some of the items necessary for operation of larger units in the steel plant.

As one of the industrial plants in the whole Anshan district, it is of minor importance.

PREPARED BY

T. L. Johnston

## ANSHAN TETO TRANSMISSION TOWER AND TRUSS COMPANY

Location: Anshan

Source and reliability of information:

(a) Actual inspection by Messrs. Taylor and Einig on June 13, 1946.
(b) Former Japanese manager of plant and former official of Manchu Steel Works, Anshan. Both are fairly reliable and their information is accepted as correct.
(c) Chinese Northeast Economic Commission, which is fairly reliable and whose information is accepted as correct.

Description of product:

(a) Transmission towers for electric power lines.
(b) Roof trusses.
(c) Light structural steel fabrication.
(d) Galvanized structural steel.

Production: 650 tons of fabricated steel per month.

Plant equipment as of 1 October 1945:

(a) Fabrication shop about 100' x 500', complete with forming and bending machines, machine tools.
(b) Galvanizing shop (about 100' x 200') with 10 acid baths.
(c) Five 5-ton monorail cranes with tracks.

Number of employees: When operating, about 350.

Removals: The Soviet Army removed the following equipment sometime in October-November 1945:

(a) 1 shaper
(b) 24 electric motors (small)
(c) 5 electric hand drills
(d) 3 electric welding machines
(e) One 5-ton wrench
(f) 6 riveting hammers
(g) 6 chipping hammers
(h) 36 tons of angle iron

The major equipment of the plant is still in place and the above removals are considered relatively small; however, their lack will reduce production.

Destruction: About 80 percent of electric control equipment was destroyed by the Chinese Communists.

Maximum capacity considered practical to restore: This plant as a whole is in good condition and should be restored to 100 per cent of its former capacity.

Equipment needed for 100 per cent restoration: The major items needed are small electric motors for the machine tools and the electric control equipment for the whole plant. Also three electric welding machines and some hand tools.

Source of raw materials:

| | | |
|---|---|---|
| Previous: | Steel | Manchu Steel Works, Anshan |
| | Zinc | Chinnampo Smelter, Korea |

Stockpiles:

(a) Raw materials - about 30 tons of small angle shapes
(b) Finished products - none

Former distribution of products: The transmission towers, roof trusses, as well as all other products of this plant were used all over Manchuria, Northern China, and Korea.

Immediate future demands for products: Light fabricated steel structures will be required for restoration work in all Manchurian areas. Many power transmission lines are down and the towers damaged. In addition, many building roofs are damaged where it will be necessary to replace the steel roof trusses.

Owner: The Chinese Nationalist Government is the present owner.

Remarks: This plant had the appearance of having been well-operated and it should be an asset when it is again opened up.

PREPARED BY

Norman Taylor

## MANCHU IRON COMPANY
## (MANCHURIAN IRON & STEEL WORKS)

**Location:** Penchihu and Kungyuan, Liaoning Province

**Date Visited:** 10 June 1946

The present operation at Penchihu and Kungyuan have grown from the opening of a coal mine at Penchihu by Okura and Company in December, 1905. The Penchihu Mai Tieh Company was established in May, 1910 and No. 1 Blast Furnace was blown in by this company in January, 1915. No. 2 Blast Furnace was blown in in December, 1917. The vertical shaft for the coal mine was started in 1937. All of these operations were on the Penchihu side of the river.

The works at Kungyuan, on the opposite side of the river, were started in 1938. No. 1 Blast Furnace of the Kungyuan works was blown in in October, 1941. No. 2 Blast Furnace was blown in in October, 1942.

In April 1944, the above-described works at Penchihu and Kungyuan were amalgamated with works at Anshan and Tungpientao (Tungpientao Iron Mfg. Co.) to form the Manchurian Iron Mfg. Co. (NOTE: This firm name often appears in records as The Manchurian Iron and Steel Works, Ltd.).

The paid up capital of the Penchihu Mai Tieh Co. before the merger was ¥200,000,000. The paid up capital of the merged company—The Manchurian Iron Mfg. Co.—was ¥640,000,000. The shareholders were the Manchukuo Government holding 20% of the stock; Manchurian Industrial Development Co., with 40%; and Okura and Co. with 40%.

**Products:**

Iron ore, rich and lean; coal; pig iron; coke; and coke oven by-products, as listed in greater detail under "production and capacity".

**Number of Employees:**

Just prior to August 15, 1945, the operations at Penchihu and Kungyuan afforded employment for 1,160 Chinese, 3,470 Japanese and 49,060 mine, mill and factory workers.

**Description of Principal Equipment:**

1. Penchihu Works (Area 1,200,000 sq. meters)
   (a) Coal mine. Reserves 360,000,000 tons, 50% of which can be mined.
   (b) Iron Smelting Works:
   — 2 Blast Furnaces, rated capacity 200 tons per day each, blast furnished by 3 - 1740 horsepower and 1 - 1200 horsepower turbo-blowers.

## MANCHU WIRE ROPE COMPANY, LTD.

Location: Liaoning Province. About 4 miles northeast of center of Anshan (this plant rather isolated and remote from other industrial sections of Anshan).

Products: Wire rope, stranded wire and plain galvanized wire.

Description of Principal Equipment: This plant was inspected by Messrs. Hurndall and Shaner on the afternoon of June 13, 1946, accompanied by Mr. Hua Hsiang Shao and local plant personnel. Practically all of the equipment is of orthodox design and construction of about 25 years ago in the United States. Principal equipment consists of preheating and annealing furnaces for the incoming wire rod (which is shipped from the No. 2 Steel Works of the Manchu Iron Works, Anshan), pickling tanks, liming and drying apparatus, 224 iron benches, 70 stranding machines for wire, 22 stranding machines for cotton or hemp centers for wire rope, a very small laboratory, annealing furnaces, die shop, galvanizing bath (dip process), repair shop, transformer station and 3 small heating boilers.

We were surprised to find that (according to our informants) only one grade of steel in wire rod form is used in this plant. Whereas in most wire rope plants, four to ten grades of steel are used, here the rods obtainable seemed to be only ordinary carbon steel from Anshan. These rods are received in diameters ranging from 5 to 7 mm. They are drawn down to desired gauges of wire, stranded and formed into wire rope. The maximum diameter of wire rope made in this plant is 60 mm. This rope consists of 6 strands of 19 wires each.

Most of the wire rope manufactured in this plant is consumed in the mining industry. Stranded wire is consumed chiefly for guying telephone and telegraph poles, small smokestacks, etc.

Average monthly output just prior to the end of the war was as follows:

| | | |
|---|---|---|
| Wire rope | 264 | M.T. |
| Stranded wire | 3.5 | |
| Galvanized wire | 50 | |
| Total | 317.5 | M.T. |

According to Chinese and Japanese former plant personnel, 10 officers of the Soviet government were quartered in the plant for two months from mid-September to mid-November, 1945. According to the same informants, the Soviets removed from the plant during this period the following equipment and supplies and products:

1 - 25-horsepower motor
1 - 20 " "
3 - 10 " "
21 - 7½ " "
77 - Motors of 5 or less horsepower each
69½ - tons finished wire rope
2½ - " stranded wire
9 - " galvanized wire
24 - " wire rods
15 - " cotton yarn for centers of wire rope

The informants also said that 21 carloads of wire rope (approximately 650 tons) were loaded and about to be taken by the Soviets, but at the last moment were left behind. This rope later was sent to the Anshan Iron Works for storage. Our informants stated some machines were removed from the repair shop, but upon investigation it is clear that these removals consisted merely of some cutting tools, portable grinders, etc. Easy-to-take items such as chain blocks, small lathes, shapers and drill presses apparently were not molested or taken. A small transformer station seemed to be in perfect order. Three small heating boilers remained intact. In a small laboratory a Leitz Metallurgical microscope appeared to be unharmed.

Our informants had no explanation as to why this plant escaped with minor damage--either by removal of equipment or by sabotage by Communist army or undisciplined mobs--compared with that suffered by other plants around Anshan, except the assumption that the plant is "out of the way" or remote from the larger industrial section. An explanation which occurred to us as we inspected the plant was that the equipment is not modern and therefore may not have seemed desirable to the Soviets.

With the replacement of certain motors and the restoration of electric power in the area, this plant could resume operations almost immediately. A stock of about 600 tons of wire rod is on hand. All dies for the wire drawing blocks have been stored. A sufficient number of dies are available to keep the plant going at capacity for six months. Manganese steel for dies in the past was obtained from the special steel companies at Penchihu and Dairen.

PREPARED BY

E. L. Shaner

## ANSHAN GALVANIZING COMPANY

Location: Anshan

Date Visited: 13 June 1946 by Messrs. Johnston & Elias

Date Put in Operation: June 1938

Description of Product: Galvanized sheet iron, plain and corrugated. Plain and galvanized wire, barbed wire. Nails, plain only.

Best Previous Production and Year (or capacity):

| | | | | | |
|---|---|---|---|---|---|
| Capacity: | Nails (not galvanized) | - 300 | tons | per | mo. |
| | Wire " " | 150 | " | " | " |
| | Wire (galvanized) | 40 | " | " | " |
| | Sheets " plain | 40 | " | " | day |
| | Sheets " corrugated | 10 | " | " | " |

Outline of Plant Equipment: Plant is divided into two parts, one part for sheets and one for wire and nails. Equipment in sheet department consists of vats for pickling, zinc dip furnace and vat, and rolls for corrugating. In the wire department equipment consists of scaling machine, annealing furnace, drawing dies, pickling vats, spools and barbed wire machines. As part of the wire department there is a room with nail cutting machines and tumbling barrels.

Number of Employees at Full Operation: 162 workmen and 28 staff - 190 total.

Removals: Inventory of plant equipment is listed as follows:

| MACHINE | ORIGINAL | REMOVED | DAMAGED | REMAINING |
|---|---|---|---|---|
| Nail Machines | 66 | 4 | 36 | 26 |
| Tumbling bbls. | 12 | - | 3 | 9 |
| Wire Drawing | 141 | - | 30 | 111 |
| Barbed Wire | 2 | - | 2 | - |
| Annealing furnaces | 7 | - | 1 | 6 |
| Galvanizing furnaces | 1 | - | 1 | - |
| Elect. Spot Welders | 5 | - | 2 | 3 |
| Galvanizing Pots | 2 | - | 2 | - |
| Machine Tools | 9 | - | 8 | 1 |
| Tensile strength mach. | 1 | - | 1 | - |
| Torsion test machine | 1 | - | 1 | - |

Removals and damage were by mob and not credited to the Soviets. Approximately 600 tons of stock were removed.

Destruction: Besides the damaged equipment listed under Removals, most of the buildings were roofless, all doors and windows broken or removed and in general the plant was a sad state of repair.

Maximum Capacity Considered Practical to Restore: Full capacity.

Equipment Needed for this Restoration: Four nail machines. Rest can be repaired and used. Materials such as lumber, glass and sheeting needed to put buildings in order to protect remaining equipment that is deteriorating.

Source of Raw Materials: (a) Previous. Sheets and rods from Anshan Steel Works. Zinc imported from Japan. Acid locally. (b) Future. Sheets and rods from local steel plant when restored. Zinc from local refinery in Mukden. Acid from various Manchurian producers.

Stockpiles: (a) Raw materials - none (b) Finished products - none.

Former Distribution of Product: All products turned over to Manchurian Trading Company on contract basis.

Immediate Future Demands for Product: Galvanized sheets, wire and nails are all urgently needed in rebuilding destroyed property. The full capacity of this plant will be required continuously.

Former and Present Plant Managers: Former, unknown; present, Mr. Odono.

Names of Soviet Officials Handling Removals: Not known.

Notes on Process: Sheet iron, cut to size (3' x 6' x 30 gauge) was received from the rolling mills, dipped in 5 per cent sulfuric acid solution, then ammonium chloride solution, drained and then dipped in first a molten lead bath followed by a molten zinc bath giving a coating of lead and zinc equal to 5 per cent of the weight of the sheet. 100 pounds of zinc were used per ton of sheets. About 20 per cent of the galvanized sheets were corrugated in 2 sizes. All handling of sheets through the steps of processing was done by manpower. No overhead cranes or labor-saving devices were used.

Wire rods 5.5 mm. in diameter were received from the rod mill of the steel works and first put through a scaling machine and then an acid and a lime dip respectively. Drawing to desired sizes was done cold through tungsten steel dies one size at a pass. The drawn wire was then passed through an annealing furnace where it was heated to dull red, then to hydrochloric acid, water and zinc chloride dips before the final dip into the galvanizing pots. The final galvanized wire was rolled on spools 450 kg. each.

Barbed wire was made by passing the plain wire through one of two barbed wire machines, one German and one Japanese design.

Nails were made in individual nail machines from rods drawn to 8, 10, 12, 14, 16, 18, 20 and 22 gauge. Nails from 1/2" to 7 inches were made, none were galvanized.

Remarks: While this plant has the appearance of being in a disrupted state, it can be restored to a production status with no real difficulty. Repairs to the buildings would be the first step.

Raw materials (sheets, rods and zinc) will be required and since these will probably come from the steel rolling mills, operation of this plant will be delayed until materials can be obtained.

PREPARED BY

T. L. Johnston

## KODOKU MACHINE WORKS

Location: Anshan

Date Visited: 13 June 1946 by Messrs. Johnston & Elias

Date Put in Operation: 1938

Description of Products: Iron and steel castings, steel forgings, small machined parts.

Best Previous Production and Year (Capacity): Not known, see following notes for explanation.

Outline of Plant Equipment: Small foundry equipment for making cast iron castings. Electric furnaces and steel casting shops. Machine shop with about 40 machine tools of small size. Reheating furnace and small rolling mill.

Number of Employees at Full Operation: 140

Removals: None

Destruction: None

Maximum Capacity Considered Practical to Restore: Full capacity

Equipment Needed to Restore: None

Source of Raw Materials: (a) Previous. Local scrap and coal. (b) Future. Local scrap and coal.

Stockpiles: (a) Raw materials - about 20 tons of scrap near furnaces. (b) Finished products - 5 tons.

Former Distribution of Products: Various departments of Anshan Steel Works.

Immediate Future Demands for Product: Small castings for restoring large units in steel plant can be made at this plant.

Former and Present Plant Managers: Former, unknown; present, H. Chio.

Soviet Official Handling Removals: Nothing removed

Notes on Process: This plant is more of a jobber foundry independent of the general steel works but supplementary in that it makes small plain castings and machines some of the castings.

The electric arc furnaces were used for melting steel scrap which was then molded into steel castings. Small ingots were also made, they were rolled in a two high, 4 stand set of rolls producing rods of various sizes.

The machine shop contained about 40 machine tools including lathes, drills and shapers for finishing the castings. Many of these castings were made for equipment used at the iron mines.

Two small cupolas were used for melting pig for use in making ordinary cast iron.

Remarks: Nothing of importance has been removed from this plant although there are machine tools and electric furnaces which are usually items removed from such plants.

The Communists (8th Army) is said to have used part of this plant for quarters and used the foundry to make some small castings in the form of cups which were used as hand grenades.

Given electric power this foundry and shop could resume work at any time. It can be of considerable assistance in making some of the items necessary for operation of larger units in the steel plant.

As one of the industrial plants in the whole Anshan district, it is of minor importance.

PREPARED BY

T. L. Johnston

## ANSHAN TETO TRANSMISSION TOWER AND TRUSS COMPANY

**Location:** Anshan

**Source and reliability of information:**

(a) Actual inspection by Messrs. Taylor and Einig on June 13, 1946.
(b) Former Japanese manager of plant and former official of Manchu Steel Works, Anshan. Both are fairly reliable and their information is accepted as correct.
(c) Chinese Northeast Economic Commission, which is fairly reliable and whose information is accepted as correct.

**Description of product:**

(a) Transmission towers for electric power lines.
(b) Roof trusses.
(c) Light structural steel fabrication.
(d) Galvanized structural steel.

**Production:** 650 tons of fabricated steel per month.

**Plant equipment as of 1 October 1945:**

(a) Fabrication shop about 100' x 500', complete with forming and bending machines, machine tools.
(b) Galvanizing shop (about 100' x 200') with 10 acid baths.
(c) Five 5-ton monorail cranes with tracks.

**Number of employees:** When operating, about 350.

**Removals:** The Soviet Army removed the following equipment sometime in October-November 1945:

(a) 1 shaper
(b) 24 electric motors (small)
(c) 5 electric hand drills
(d) 3 electric welding machines
(e) One 5-ton wrench
(f) 6 riveting hammers
(g) 6 chipping hammers
(h) 36 tons of angle iron

The major equipment of the plant is still in place and the above removals are considered relatively small; however, their lack will reduce production.

Destruction: About 80 percent of electric control equipment was destroyed by the Chinese Communists.

Maximum capacity considered practical to restore: This plant as a whole is in good condition and should be restored to 100 per cent of its former capacity.

Equipment needed for 100 per cent restoration: The major items needed are small electric motors for the machine tools and the electric control equipment for the whole plant. Also three electric welding machines and some hand tools.

Source of raw materials:

Previous: Steel - Manchu Steel Works, Anshan
Zinc - Chinnampo Smelter, Korea

Stockpiles:

(a) Raw materials - about 30 tons of small angle shapes
(b) Finished products - none

Former distribution of products: The transmission towers, roof trusses, as well as all other products of this plant were used all over Manchuria, Northern China, and Korea.

Immediate future demands for products: Light fabricated steel structures will be required for restoration work in all Manchurian areas. Many power transmission lines are down and the towers damaged. In addition, many building roofs are damaged where it will be necessary to replace the steel roof trusses.

Owner: The Chinese Nationalist Government is the present owner.

Remarks: This plant had the appearance of having been well-operated and it should be an asset when it is again opened up.

PREPARED BY

Norman Taylor

## MANCHU IRON COMPANY
## (MANCHURIAN IRON & STEEL WORKS)

**Location:** Penchihu and Kungyuan, Liaoning Province

**Date Visited:** 10 June 1946

The present operation at Penchihu and Kungyuan have grown from the opening of a coal mine at Penchihu by Okura and Company in December, 1905. The Penchihu Mai Tieh Company was established in May, 1910 and No. 1 Blast Furnace was blown in by this company in January, 1915. No. 2 Blast Furnace was blown in in December, 1917. The vertical shaft for the coal mine was started in 1937. All of these operations were on the Penchihu side of the river.

The works at Kungyuan, on the opposite side of the river, were started in 1938. No. 1 Blast Furnace of the Kungyuan works was blown in in October, 1941. No. 2 Blast Furnace was blown in in October, 1942.

In April 1944, the above-described works at Penchihu and Kungyuan were amalgamated with works at Anshan and Tungpientao (Tungpientao Iron Mfg. Co.) to form the Manchurian Iron Mfg. Co. (NOTE: This firm name often appears in records as The Manchurian Iron and Steel Works, Ltd.).

The paid up capital of the Penchihu Mai Tieh Co. before the merger was ¥200,000,000. The paid up capital of the merged company—The Manchurian Iron Mfg. Co.—was ¥640,000,000. The shareholders were the Manchukuo Government holding 20% of the stock; Manchurian Industrial Development Co., with 40%; and Okura and Co. with 40%.

**Products:**

Iron ore, rich and lean; coal; pig iron; coke; and coke oven by-products, as listed in greater detail under "production and capacity".

**Number of Employees:**

Just prior to August 15, 1945, the operations at Penchihu and Kungyuan afforded employment for 1,160 Chinese, 3,470 Japanese and 49,060 mine, mill and factory workers.

**Description of Principal Equipment:**

1. Penchihu Works (Area 1,200,000 sq. meters)
   (a) Coal mine. Reserves 360,000,000 tons, 50% of which can be mined.
   (b) Iron Smelting Works:
      — 2 Blast Furnaces, rated capacity 200 tons per day each, blast furnished by 3 - 1740 horsepower and 1 - 1200 horsepower turbo-blowers.

- — 2 batteries of coke ovens (one of 46 and one of 52) with capacity of 700 tons of coke per day.
- — Greenawalt-process sintering plant, 3 pans with total capacity of 180 tons per day.
- — Briquetting plant (Sutteciff-type) with six presses and five ovens with total capacity of 470 tons per day.
- — Sponge iron plant consisting of 8 ovens and auxiliary equipment with capacity of 2000 tons per year.

(c) Electric power stations Nos. 1 and 2.

2. Kungyuan Works:

(a) Iron Smelting Works:

- — 2 Blast Furnaces, each with rated capacity of 500 tons per day: Blowing equipment — 3 turbo blowers 6000 HP: Dingler type gas washers.
- — Sintering plant. A-1-B system: 12 pans with total capacity of 200 tons per day
- — Briquetting plant (Sutteciff-type) 18 presses and 14 ovens with total capacity of 1400 tons per day.
- — Battery of 120 Otto byproduct coke ovens, capacity 1400 tons daily.

(b) By-Products Plant:

- — Blowers, 3 sets, capacity 32,000 cu. m./hr.
- — Ammonium Sulphate plant, capacity 10,000 tons/yr.
- — Benzol Plant: 4 scrubbers, 6 stills, capacity 9,000 tons benzol/yr.
- — Tar Plant: 1 pipe still and 3 distillation towers.
- — Crude Anthracene Plant, capacity 1000 tons/year
- — Crude Naphthalene Plant, capacity 3500 tons/year
- — Sulphuric Acid Plant, Lead Chamber type

The works are served by a private railroad with 136 km of track, 45 steam locomotives, 17 electric locomotives and 486 cars.

## Production and Capacity:

Total output of iron ore up to Aug. 15, 1945: 3,447,368 MT
Total output of coal " " " " " 18,156,113 MT

### Production and Capacity, 1944 (In Metric Tons)

| | Production | Capacity |
|---|---|---|
| Iron ore, Rich | 554,244 | 720,000 |
| " " Lean | 463,274 | 1,000,000 |
| Coal | 1,004,000 | 1,000,000 |
| Pig Iron: | | |
| Penchihu | 106,648 | 140,000 |
| Kungyuan | 267,229 | 360,000 |
| Total Pig Iron | 373,877 | 500,000 |
| Coke: | | |
| Penchihu | 231,860 | 250,000 |
| Kungyuan | 336,883 | 500,000 |
| Total Coke | 568,743 | 750,000 |
| Briquettes: | | |
| Penchihu | 109,000 | 170,000 |
| Kungyuan | 237,600 | 520,000 |
| Total Briquettes | 346,600 | 690,000 |
| Sinter: | | |
| Penchihu | 31,000 | 70,000 |
| Kungyuan | 15,000 | 74,000 |
| Total Sinter | 46,000 | 144,000 |
| Crude Tar: | | |
| Penchihu | 6,863 | 8,300 |
| Kungyuan | 12,362 | 26,000 |
| Total Crude Tar | 19,225 | 34,300 |
| Ammonium Sulphate: | | |
| Penchihu | 1,094 | 2,600 |
| Kungyuan | 3,610 | 10,000 |
| Total Ammonium Sulphate | 4,704 | 12,600 |
| Benzol: | | |
| Kungyuan | 2,186 | 9,000 |

## IRON MINE

Name: Miao ei Gou

Location: 21 km southeast of Penchihu

Date Visited: Not visited by inspection group due to the fact that the mine was in Communist hands. Data and information was obtained from staff at Penchihu.

Products: Rich and lean iron ore.

Number of Employees: 15,000 including mines and ore concentration plant.

Ore Deposit:

Staff members' statements accompanied by maps show the deposit to be a large body of low grade iron ore in which are located two large dykes of high grade magnetite. Ore reserves are estimated at 450 million tons of 33% ore and 10 million tons of high grade containing 62% iron. The two parallel dykes are 200 meters long, 40 meters wide and dipping at 75% to unknown depths.

Mining is underground through tunnels, open stopes and glory holes; no open pits are worked. Drilling is done by machines and blasting by use of liquid oxygen.

Ore Dressing:

The ore is crushed to 6 inch size underground and then to one-half inch in secondary crushers outside the portal of the main haulage way. It is then sent to the ore concentrator where it is finely ground in ball mills to 150 mesh and concentrated in wet magnetic concentrators. Lean and rich ores are each concentrated separately and kept separate during subsequent treatment. This seemingly extra concentration especially of the rich ore is practiced primarily for the purpose of eliminating as much silica and phosphorous as possible with the ultimate object of producing low phosphorous pig iron in the blast furnaces:

Typical Analyses of Ores and Concentrates Are As Follows

| Material | Fe% | $SiO_2$% | P% | S% |
|---|---|---|---|---|
| Rich ore | 62 | 16 | .017 | 0.10 |
| " " Concentrate | 69 | 2.8 | .008 | 0.012 |
| Lean ore | 33.5 | 50.0 | .06 | 0.03 |
| " " " | 63 | 10.0 | .017 | 0.03 |

Mine Production:

In 1944 there were 463,000 tons of lean ore and 410,000 tons of rich ore produced. Expected production of 750,000 and 500,000 tons respectively for 1945 were not realized but the actual tonnages are not available. The 1944 production of concentrates from lean ores was 253,000 tons and from high grade ores 358,000 tons. All of these concentrates were shipped to Penchihu and Kungyuan where the high grade concentrates were briquetted and then smelted in blast furnaces to low phosphorous pig iron while the low grade was sintered or briquetted before smelting to ordinary pig iron.

Removal of Equipment at Mine and Ore Dressing Plant:

Statements by the staff at Penchihu indicate that some of the compressors at the mine were removed but they had not been checked. In April it was reported that the liquid oxygen plant was in operating order. Also reported was the fact that all equipment in the plant for concentrating lean ores had been removed by the Soviets.

## COAL MINE

Name: Penchihu Coal Mine

Location: Penchihu

Date Visited: 10 June 1946 - Messrs. Hurndall. Shaner, Taylor, Johnston

Coal Deposit:

The Penchihu coal mine consists of 17 seams of good coking coal varying in thickness from 0.5 to 3 meters. The mine has been exploited for over 30 years and at present is producing approximately 200 tons of coal per day from 8 seams. The long wall method of mining is standard practice. Coal is removed by belt conveyor through a 25° inclined shaft. Reserves are estimated as 360 million tons of which about 25 per cent is low phosphorous coal.

Coal Treatment:

On reaching the surface the coal is cleaned by hand picking off waste and by washing. At present the cleaned coal is being stockpiled. Because of its swelling property and low fusing ash it is mixed with 30 per cent Fouhsin coal when fed to coke ovens.

New Shaft:

A new vertical shaft 1500 feet deep was sunk to intercept the coal seams at a deep level. This shaft is 7 meters in diameter and concreted its full depth. The shaft is divided into two compartments, one for coal and the other for transfer of timbers, workmen and supplies. Each compartment is serviced by a separate hoist located in massive hoist room 200 feet above the collar of the shaft.

The surface plant surrounding the shaft consists of conveyors, screens, crushers and washing plant. The whole installation of shaft and surface plant is of modern design but only 95 per cent complete at war's end so never used to extract coal.

Removals:

The Soviets are reported to have taken some motors, pumps, machine tools, and conveyor belts but since construction was incomplete it was difficult to determine what had been installed and later removed.

## IRON WORKS

Penchihu produces pig iron but no steel plants are located at Kungyuan.

Penchihu Plant:

This plant was built in 1915 and is located near the portal of the coal mine. It consists of coal screening and washing plants, coke ovens, briquetting and sintering plants, two-200 ton blast furnaces, pig iron casting machines, powerhouse and auxiliary equipment. Production was about 100,000 tons of pig iron per year, all of which was cast into pigs and shipped to Japan.

Removals from this plant were negligible and if power can be supplied the plant could operate at close to previous production rate in a short time.

Kungyuan Plant:

The Penchihu plant was crowded into a narrow canyon leaving no room for expansion so a new plant was started across the river and about a mile below - and called Kungyuan. The new plant consists of coke-ovens with byproduct plants, sintering and briquetting plants and blast furnaces. Plans were to erect open hearths and rolling mills but they did not materialize so all of the pig iron was exported to Kure, Japan.

Notes On Operations:

Location of a steel industry at Penchihu has several factors in favor of low cost production; vix, (1) source of large supply of good coking-coal, (2) large iron deposit 15 miles distant, and (3) unlimited limestone and dolomite nearby.

The greatest reserve of iron ore is low grade requiring concentration before smelting. The high grade ore is of much better grade than average iron ores but is also concentrated to remove impurities and to facilitate subsequent smelting in the blast furnaces.

Since finely divided ore is not suitable for smelting the extra steps of sintering and briquetting are necessary. Briquetted ore is favored over sintered ore for better blast furnace operation. Briquetting consists of machine pressing the fine ore united with 3 per cent slacked lime into molds 8" square and 2" deep. The briquettes are stacked on cars holding 3 tons and the cars rolled into a tunnel-like kiln and heated to 1350 degrees C. by producer gas. At one car each 20 minutes a heat treatment of 13 hours yields firm briquettes capable of withstanding rough handling and very suitable for blast furnace charge. All high grade concentrates are briquetted, smelted with low phosphorous coke and yield pig iron with a phosphorous content not over 0.025 per cent.

At the Kungyuan works there are 18 briquetting presses and 13 tunnel kilns with a total capacity of 2500 tons per day.

Sintering was done in 12 AIB machines, each with a capacity of 50 tons per day. Concentrates from low grade ore and flue dust were sintered and the sinter mixed with briquettes as part of the blast furnace charge in the production of ordinary pig iron.

Blast furnaces were reported to operate on the Corby method.

Notes On Removals:

In the briquetting plant all 18 presses were gone - said to have been taken by the Soviets. These presses are not large and would cost approximately $2,500 each.

The 12 AIB sintering pans were also missing, as well as electric motors and other auxiliary equipment without which these plants cannot operate. The tunnel kilns, however, appeared to be untouched, being made of brick.

In the blast furnace department the stocks were in good shape but the hoisting equipment, turbo-blowers and hot stove valves were missing, also the mud gun and gas washer.

In the coke ovens the auxiliary equipment for charging and discharging were missing. All equipment for recovering byproducts except in the ammonium sulfate plant were missing.

Destruction:

The Communist 8th Army, which held this area for a time after the Soviets left, added their bit in a large way of preventing resumption of operations. All 5 bridges crossing the river were dynamited to the extent that at least one span was removed, making all bridges unusable for the present but reparable.

No. 2 powerhouse was also dynamited by the Communists. The damage however is such that at least one-half of the power generating capacity can be salvaged.

Some rolling stock such as charge cars, ladles, locomotives, etc., was seen but appeared to be inadequate for the plant. Reports are that over half was taken by the Soviets who also removed two of the three pig casting machines.

Remarks:

While the Penchihu works are crippled insofar as resuming immediate production is concerned the actual removals represent a small percentage of the total installation. A rough estimate of $1,000,000 in new equipment would enable complete restoration to be made.

By mining only high grade ore and smelting only lump ore in the blast furnaces partial operation could be resumed without much difficulty.

Since pig iron from Penchihu will no longer be exported to Japan it remains as a product suitable for export to other world markets or to be made into steel at Anshan.

## SPONGE IRON

A comparatively small amount of sponge iron was made in a sponge iron plant near the outskirts of Penchihu. The plant consists of brick kilns in which sponge iron is made in batches by the Swedish sagger method

High grade concentrates are hand molded into disc like cakes 6" diameter and 1" thick, using 10% slaked lime as a binder. The cakes are placed in 18" fire clay saggers with alternate layers of coke breeze, six cakes to each sagger. The loaded saggers are then piled in the cold brick kiln which holds 8 tons. The kiln is exteriorally fired and a temperature of 1000° C. maintained for 30 hours, then the kiln is allowed to cool, the saggers removed and the reduced cakes or sponge iron recovered. Analysis shows 97.2% total iron, 96.1% metallic Fe or 99% reduction, 2.3% $SiO_2$, 0.017% S, 0.008% P, and 0.04% carbon. This iron is then melted in electric furnaces which yields ingots analyzing 0.11% C., 0.11% Si, 0.006% P, 0.009% S and 0.05% Mu, a very high grade steel which was sent to Japan. Maximum production of this plant did not exceed 1,500 tons annually in the 6 years operated.

PREPARED BY

E. L. Shaner
T. L. Johnston

# MANCHU SPECIAL STEEL COMPANY

**Location:** Liaoning Province. Kungyuan, northeast of the Coke Oven and Byproduct Plants of the Miyanoharu Works of Manchu Iron Company, Ltd.

**Products:** Electric furnace, steel ingots for forging and rolling.

**Description of Principal Equipment:** This plant was inspected by Messrs. Johnson and Shaner on June 10, 1946. We were accompanied by Dr. Shao and Mr. H. H. Shao and by local plant personnel. The principal equipment consisted of two 5-ton, one 3-electrode Heroult-type electric furnace for making ingots for rolling and forging, a forge shop and a rolling mill consisting of a 3-hi roughing mill and five stands of finishing rolls for rolling rods. This plant specialized in alloy steels and was reported to have an annual capacity of 4,000 tons of rolled and forged products just before the war ended. This seems low.

Our informants stated this plant had been crippled considerably by the removal of equipment by the Soviets. They were said to have removed one of the two electric furnaces, six air compressors, one 1,200 ton hydraulic press, five steam hammers, a crane motor. Rolling mill was intact. It is small and used for making small bars.

With half of the melting equipment gone and with the forge shop stripped of essential press and hammer equipment, it is difficult to see how this plant can produce any more than half of its former production without heavy replacements.

PREPARED BY

E. L. Shaner

NOTE: This plant made special high grade steel from sponge iron produced in a separate plant. Most of the high grade steel was sent to the Kure Arsenal in Japan.

T. L. J.

## CHINHSI RAILWAY WORKS

Location Extends from Chinhsi to Yangchiachangtzu.

Former Owner: Private Japanese interests, with further identity unknown.

Present Owner: National Economic Administration, with Mr. F. S. Wong as the appointed Chinese manager.

Persons interviewed with regard to the railroad with their position are as follows:

Mr. F. S. Wong - Manager
Mr. K. F. Sze - In charge non-ferrous mining in Manchuria.

Fuel is coal, formerly from Fouhsin. At present coal from any available source is used.

Equipment:

2 locomotives in good condition
1 locomotive in need of repairs
1 locomotive in process of repair
18 self-dumping ore cars (30 ton capacity)
1 box car
1 caboose
35 km. of main track and roadbed—standard gauge with grades up to 4 percent
Spurs and sidings estimated at 5 km.

It was reported that 2 passenger cars and several motor cars were removed by the Soviets.

Equipment Needed: 1 locomotive; 2 passenger cars; and several motor trucks.

Employees: The present number of employees is estimated at about 50 and has undoubtedly declined greatly due to non-operation of the mines that supplied the bulk of the railroad freight.

All employees seen were at present male adult Chinese, and it was reported that no Japanese had been retained.

PREPARED BY

Thomas A. Hendricks

## South Manchurian Railway Company Repair Shops

Location: Changchun

Source and Reliability of Information: An actual inspection was made by Norman Taylor and H. N. Thorne, 25 June 1946. Information was furnished by a former Japanese repair manager for the railroad shops. He is completely reliable and his information was accepted as true. Further information came from Northeastern Chinese Economic Commission, who are considered fairly reliable and their statements accepted as true.

Date put in Operation: Railroad shop started in 1916 as a part of Kirin-Changchun railway. Came under South Manchurian Railroad in 1933.

Description of Product: Repair of railroad locomotives, passenger cars, freight cars, and other railroad equipment. However, repair of locomotives had ceased in June 1945 and machinery from the locomotive shops was in the process of being moved by the Japanese to Kirin. The move was 90 percent complete.

Capacity:

Passenger cars - 300 per year repaired
Freight cars - 1500 per year repaired

Plant Equipment: This was a fully equipped car repair plant with buildings covering a ground area about 1000 yards wide and 2000 yards deep. The major installations as of October 1, 1945 are as follows:

(a) Fully equipped passenger car shop - 75' x 500'
(b) " " freight car shop - 75' x 500'
(c) " " foundry with cupola- 75' x 200'
(d) " " forge shop - 50' x 150'
(e) " " machine shops (2 bldgs.) each 50' x 200'
(f) Boiler house, official buildings, and outside installations.

Number of Employees: About 1675 when in full production.

Removals: On 12 October 1945, the Soviet Army took over these shops and immediately started the supervised removal of almost all machinery and equipment. The Japanese repair manager, was given orders to make the necessary preparations for shipment and to load everything on freight and flat cars. This was done, using the regular plant workmen and the plant was stripped by 25 October 1945. The cars were moved out of the plant, made up into trains, and hauled away.

Following is a brief list of removals. More detailed information and complete inventory of removals will be found in Source File No. 8-N-1.

Equipment and Materials Removed by Soviets

| | Number | % of Original | Approx. Value U. S. Dollars |
|---|---|---|---|
| Machine tools for metal | 51 | 88 | $163,000 |
| Machine tools for wood | 15 | 94 | 58,300 |
| Industrial machines | 58 | 82 | 543,200 |
| Instruments and tools | | 86 | 74,400 |
| Metals, woods, parts | | 35 | 222,000 |
| TOTAL | | | $ 1,060,900 |

After the Soviet Army had stripped the plant (as indicated above) local Chinese were allowed free access to the property and the following removals took place:

Equipment and Materials Removed by Local Chinese

| | Number | % of Original | Approx. Value U. S. Dollars |
|---|---|---|---|
| Machine tools for metal | 5 | 10 | $ 16,500 |
| Instruments and tools | | 14 | 11,200 |
| Metals-woods parts | | 41 | 261,600 |
| TOTAL | | | $289,300 |

Destruction: After the removals very little was left of this activity except the shells of the buildings. About one half of these then were destroyed by fire which was caused, for the most part, by a Chinese Communist ammunition train which blew up on a siding near the plant. Remains of the blown up cars were observed.

The removals at this plant were almost 100 percent and consequently, for all practical purposes, it has lost 100 percent of its capacity. This means 15 percent of passenger cars and 16 percent of freight car repair capacity of the South Manchurian Railway was lost.

This plant cannot be restored but must be completely rebuilt. Repair facilities for railroad equipment must be available if Manchurian railroads are to continue operation. Whether to rebuild here will depend upon a survey of the overall railroad repair facilities.

Source of Raw Materials:

(a) Previous - Sumitomo Iron Works, Mukden, and Showa Steel Works, Anshan.

(b) Future - Unknown

Former Distribution of Product: South Manchurian Railway Company.

Present Plant Manager: Chinese Government.

Remarks: This was a well-handled removal job by the Soviets. The speed and efficiency with which it was done was probably due to the enforced cooperation of the Japanese and the fact that the equipment was easily loaded on cars.

There was originally a locomotive repair shop here but the Japanese were moving it to Kirin. Ninety percent (90%) of this had been completed by October 12, 1945. The remaining 10 percent of the machinery, tools, and equipment were taken by the Soviets along with that used for the car repair shops.

PREPARED BY

Norman Taylor

## NIPPON AIR BRAKE COMPANY

Location: Changchun, located in former locomotive repair shops of the South Manchurian Railway Company.

Source and Reliability of Information: Actual inspection was made by Norman Taylor and H. N. Thorne, 6 July 1946. Information was furnished by a former Japanese Manager of the adjacent South Manchurian Railway shops. He is completely reliable and his information was accepted as true. Further information came from the Northeast Chinese Economic Commission, who are considered fairly reliable and their statements are accepted as true.

Date Put in Operation: It was planned in 1944 to establish a manufacturing plant for railroad airbrakes in Manchuria as up to that time equipment of this sort had to be imported. In June 1945 two-thirds of the facilities of the Nippon Air Brake Company were transferred from Japan and installation of this machinery and equipment was started in the former South Manchurian Railway locomotive shops which were then vacant, machinery from these shops having been moved to Kirin by the Japanese.

Product: Railroad air brakes. Planned production was air brake equipment for 80 locomotives and 1500 railroad cars per year.

Plant Equipment: As of 1 October 1945, it consisted of:

(a) Two large buildings about 120' x 400'.
(b) 136 machine tools.
(c) Two heavy overhead traveling cranes.
(d) Necessary tools and auxiliary equipment for casting, machining, and assembling air brakes.

NOTE: With the exception of the two cranes and about 30 machine tools which were being installed, all of the other manufacturing equipment, plus a good quantity of finished and unfinished air brake parts, were still crated and not unpacked.

Employees: There were about 120 employees as of 1 October 1945 but more would have been used when production started.

Removals: At the same time (12 - 25 October 1945) that the Soviet Army made the removals from the South Manchurian Railway shops, they removed all of the machinery, equipment, and parts of the Nippon Air Brake Company. It was made easy for them because railroad cars were available right in the plant, cranes were set up, and most of the removals were still crated from the shipment from Japan. Below is tabulated list of the major removals:

Equipment and Material Removed by the Soviet Army

| | Number | % of Original | Approx. Value U. S. Dollars |
|---|---|---|---|
| Machine tools | 136 | 100 | $2,500,000 |
| Industrial equipment | 23 | 100 | 250,000 |
| Apparatus and tools | | 100 | 530,000 |
| Patterns | 85 | 100 | 10,000 |
| Parts of airbrakes (unfinished) | 18,825 | 100 | 35,000 |
| Parts of airbrakes (finished) | 24,555 | 100 | 45,000 |
| TOTAL | | | $3,370,000 |

Destruction: No destruction took place as everything except the two buildings were removed by the Soviet Army. The two buildings are not materially damaged.

Maximum Capacity Considered Practical to Restore: This question can be answered only when a complete survey has been made of all the Manchurian railroads. Certainly it will be necessary to have a plant to manufacture airbrakes and it may be that it should be located in Changchun. Some consideration might be given to moving portions of the Nippon Air Brake Company in Japan to Manchuria at the site selected for this industry.

Former Distribution of Product: South Manchurian Railway Company.

Name of Present Plant Manager: Chinese Government.

Remarks: This was a complete removal in that nothing is left of any machinery or equipment. The production is 100 percent lost.

PREPARED BY

Norman Taylor

## MUTANCHIANG RAILWAY WORKS

Location: Mutanchiang, Kirin Province, Manchuria.

Date Visited: 30 June 1946, by Messrs. Cleaveland, Taylor, Swift, Thorne, and Capt. Scott.

Source and Reliability of Information: 1) Report obtained later on Railway Works, Locomotive and Car inspecting stations by a former Japanese engineer (reliable.) 2) Verbal information at time of inspection obtained from Chinese Communist escort (not reliable).

This plant repaired and inspected locomotives, passenger cars, and freight cars. The annual repair capacity before 15 August 1945 was 190 locomotives and 1200 freight cars. As a result of removals by U.S.S.R. and war damage this capacity has been reduced to zero. On 8 August 1945 this locomotive inspection station was capable of making per month the following periodic inspections: 47 - 6 months, 280 - 30 days, and 560 ten day. As a result of removals by U.S.S.R. and destruction, this capacity has been reduced to zero.

On 8 August 1945, the freight car inspection station was capable of making the following periodic inspections per month: 1) 18 months 168; 2) 6 months 568; 3) 45 days 2,745. In addition they are equipped to repair 487 freight cars per month. Based on observations mady by the inspection team listed above, it is believed this capacity has been reduced to zero as a result of removals by U.S.S.R. and war damage. This figure, as to decrease in inspection capacity, conflicts with Mr. Yamasaki's report, however, this plant in its present condition is not capable of doing any work.

On 8 August 1945, the passenger car inspection station was capable of making the following periodic inspections and repairs: 1) 6 months 43; 2) 45 days 338; 3) Repairs - 50. Again, although it conflicts with the Japanese report, we believe this capacity is now zero.

A detailed list of the equipment at this plant is not available; but it was believed to contain these departments: 1) Assembly shops; 2) Machine shops; 3) forging shop; 4) Boiler room; 5) Power plant and transformer station and 6) Foundry.

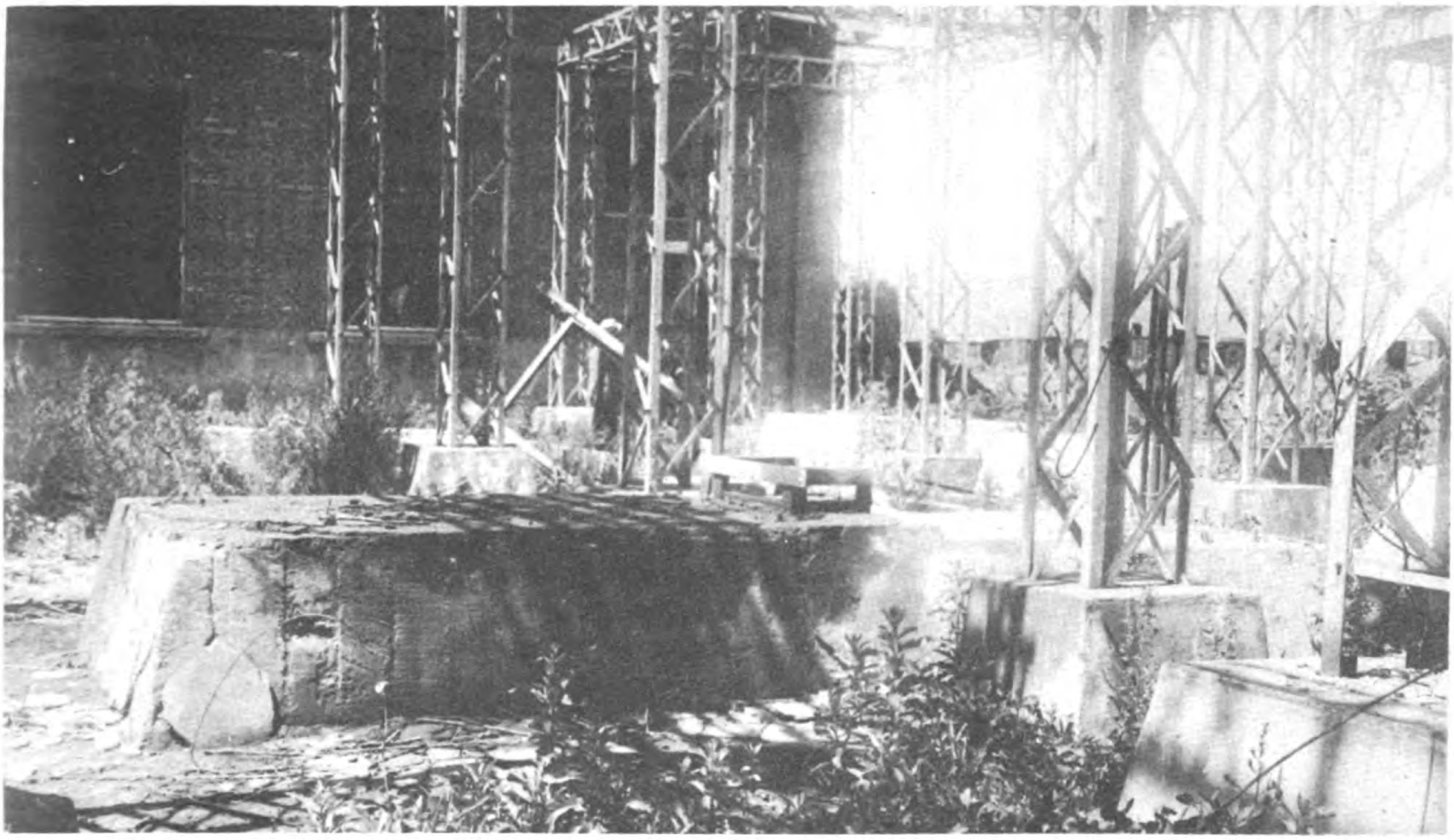
As a result of the fire in the assembly rooms it was difficult to determine if there had been removals. However, in the machine shops all of the machine tools had been removed prior to the fire. There were about 50 machine tool foundations from which the machine tools had been removed. Inspection of the forging shop revealed that 8 steam hammers had been removed before the fire. Approximately three boilers had been taken from the boiler room. This was evidenced by the presence of a large hole in the side of the building, a large number of mechanically cut boiler tubes just outside building and the fact that all electric cables had been mechanically severed. The power plant was believed to have one generator and a compressor both removed along the same pattern. All transformers had been removed. The building that housed this equipment was fire proof and there was no doubt that the equipment had been deliberately removed. Everything, except one cupola, was removed from the foundry, including molds and an over-head crane. Removals by U.S.S.R. are valued by the Japanese at $4,480,000. This is an approximation. We were told by the communist members who escorted us thru this plant that the equipment had been removed by the retreating Japanese. This is difficult to credit because the Japanese did not have enough time and the equipment has not been located elsewhere. It is logical to assume that these removals as well as the destructions by fire occurred in the latter part of August 1945.

Insofar as the railroads of Manchuria are concerned the work that this plant would do would be in great demand, but the restoration of this particular plant would mean rebuilding of same.

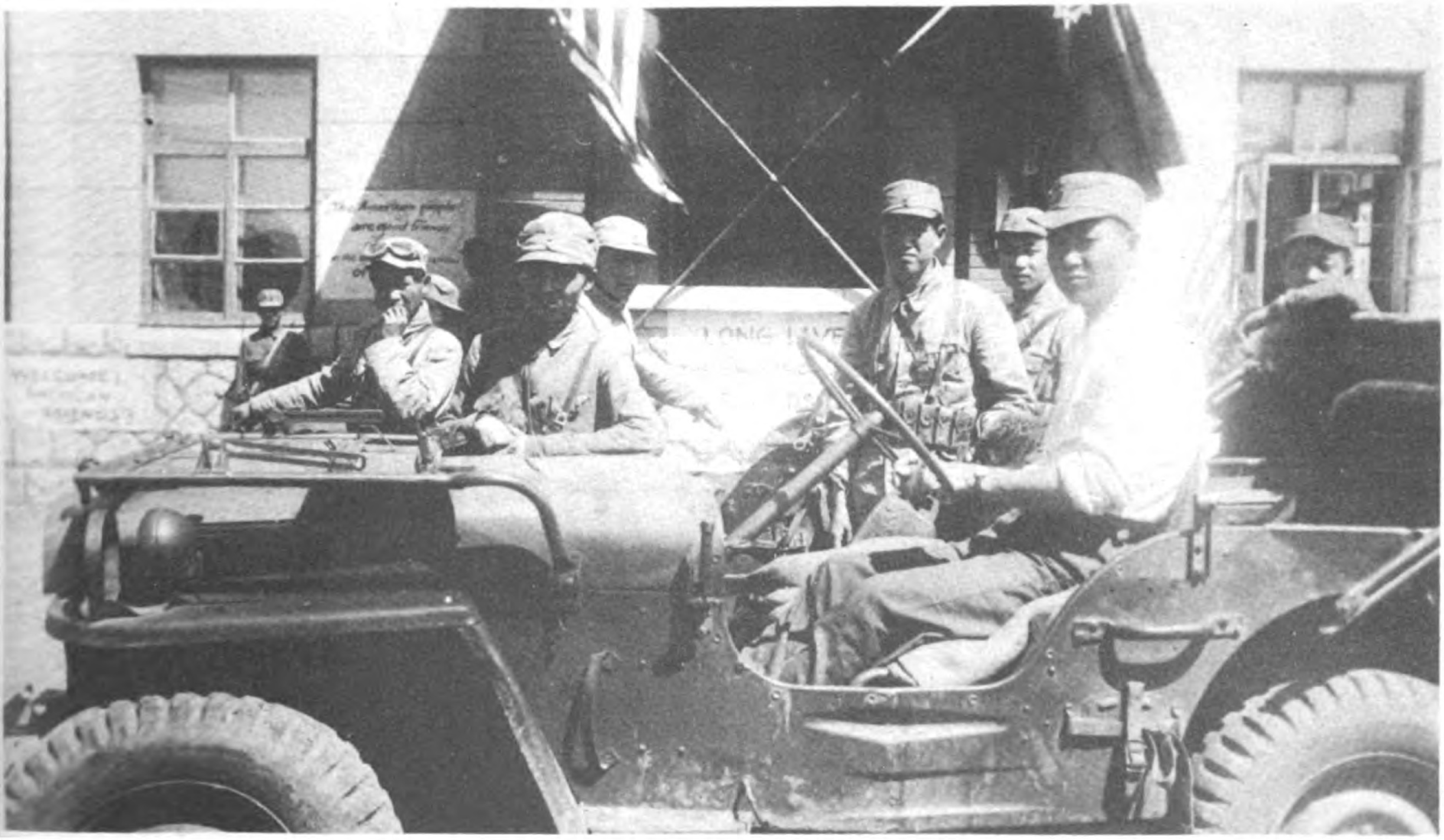
Names of U.S.S.R. officials handling removals from this plant are not known.

PREPARED BY

Capt. E. M. Scott



MUTANCHIANG RAILWAY SHOPS - Empty foundations for large transformers at powerhouse.


The American people are good friends
LONG LIVE
WELCOME AMERICAN FRIENDS

Mutanchiang Communist soldier guard for Pauley Mission

Appendix 6-a

## SOUTH MANCHURIAN RAILWAY SUBSIDIARY COMPANIES

Source File 302-Y.1-1

| Classification | Name of Firm | Location of Head Office | Established | Capital | | South Manchurian Shares | |
|---|---|---|---|---|---|---|---|
| | | | | Authorized | Paid Up | Executed | Paid In |
| Industry | Nippon Refined Wax Co. | Dairen | Feb. 1929 | 4,000 | 4,000 | 4,000 | 4,000 |
| | Dairen Ceramic Ind. Co. | " | July 1925 | 1,200 | 1,200 | 1,200 | 1,200 |
| | Manchuria Chem. Ind. Co. | " | May 1933 | 26,000 | 26,000 | 12,925 | 12,225 |
| | Dairen Ind. Co. (Timber) | " | Apr. 1918 | 1,000 | 1,000 | 508 | 508 |
| | Fushun Cement Co. | Fushun | Apr. 1934 | 7,500 | 6,875 | 3,750 | 3,125 |
| | Daiman Gold Mining Co. | Changchun | June 1934 | 200 | 50 | 200 | 50 |
| | Fushun Mining Co. | Fushun | Aug. 1937 | 2,000 | 1,250 | 1,000 | 625 |
| Business | Yinkou Water Supply Co. | Yinkou | Nov. 1906 | 1,000 | 1,000 | 660 | 660 |
| | Nichi-Man Trading Co. | Changchun | Dec. 1939 | 60,000 | 40,000 | 30,000 | 20,000 |
| Farming and Real Estate | Dairen Agricultural Co. | Dairen | Apr. 1929 | 10,000 | 5,000 | 10,000 | 5,000 |
| | Man-Sen Pillar Company | Antung | Dec. 1919 | 1,500 | 1,500 | 1,500 | 1,500 |
| | Manchuria Real Estate Co. | Fentien | Oct. 1937 | 20,000 | 15,000 | 20,000 | 15,000 |
| Communication | Dairen Steamship Co. | Dairen | Jan. 1915 | 25,700 | 25,700 | 25,700 | 25,700 |
| | Dairen City Traffic Co. | " | May 1926 | 15,000 | 12,500 | 15,000 | 12,500 |
| | Kokusai Transportation Co. | " | Aug. 1926 | 15,000 | 12,000 | 15,000 | 12,500 |
| | " " " | " | Aug. 1926 | 100,000 | 78,700 | 53,000 | 53,200 |
| | Fukusho Labour Supply Co. | " | Oct. 1926 | 1,800 | 1,800 | 1,800 | 1,800 |
| | Nichi-Man Warehouse Co. | Tokyo (Japan) | May 1927 | 15,000 | 15,000 | 7,500 | 7,500 |
| | Dairen Dock & Eng. Co. | Dairen | Aug. 1937 | 4,500 | 4,500 | 4,500 | 4,500 |
| Others | Manchuria Mining Co. | Fentien | June 1938 | 10,000 | 7,500 | 10,000 | 7,500 |
| | Tangkangtsu Hot Spring Co. | Tangkangtsu | Mar. 1920 | 1,000 | 250 | 505 | 126 |
| | Manchuria Industry Promotion | Changchun | Dec. 1937 | 5,000 | 5,000 | 2,500 | 2,500 |
| | Toa Civil Engineering Co. | Fentien | Jan. 1920 | 5,000 | 1,250 | 2,510 | 627 |
| | Kantoshu Ground Const. Co. | Dairen | Aug. 1939 | 10,000 | 5,000 | 5,000 | 2,500 |
| | Manchuria Movie Assn. Co. | Changchun | Aug. 1937 | 9,000 | 8,500 | 4,500 | 4,250 |

SOURCE: Information obtained from "Economical Review of Northeastern District of China" (page 54).

Assets

**Subscribed Capital Stock Uncall**

**Fixed Assets:**

Railway and Equipment .....

Harbours and Wharves .....

Collieries and Equipment ....

Oil Distillating Plant .......

Coal Liquefaction Plant ....

Iron Plant ...............

Facilities and Equipment not

Offices .................

Employees' Dwellings ....

Miscellaneous ..........

**Total Fixed Assets** ..

**Investments:—**

Bonds and Shares:

Imperial Japanese Governme

Manchoukuo Government

Bonds ...............

Shares of Subsidiary Compa

Other Bonds, Shares, etc.

**Loans:**

Loans to Manchoukuo Go

Railways ..............

Loans to Other Concerns .

**Total Investments** ..

**Current Assets:—**

Cash in Hand and at Banks .

Bills Receivable ...........

Exchange Accounts ........

Accounts Receivable .......

Guaranty Funds ..........

Collateral Securities, etc. ...

Due from Other Concerns ..

Inventories:—

Merchandise:—Coal and Ot

Material and Supplies ...

**Total Current Assets**

**Unadjusted Accounts:—**

Partial Payments made in Ad

Discount on Bonds .........

**Total Unadjusted Acc**

**Total Assets** .......

(f

Remarks

| | |
|---|---|
| Railway | ................... |
| Harbours and Wharves | ....... |
| Collieries | ................ |
| Oil Distillation | ........ |
| Generals | ................... |
| Interest | .................. |
| Depreciation, Depletion, etc. | . |
| **Net Profit** | ........... |
| **Total** | ......... |

| | Amount<br>Details | Total |
|---|---|---|
| 000,000 shares | 400,000,000.00 | |
| 000,000 shares | 400,000,000.00 | |
| .............. | 800,000,000.00 | 800,000,000.00 |
| .............. | 696,208,000.00 | |
| .............. | 103,792,000.00 | |
| .............. | 47,990,000.00 | |
| .............. | 210,900,000.00 | |
| .............. | 20,000,000.00 | |
| .............. | 278,890,000.00 | 278,890,000.00 |
| .............. | 951,825,000.00 | 951,825,000.00 |
| .............. | 48,350,000.00 | |
| .............. | 42,961,545.61 | |
| .............. | 102,600.00 | |
| .............. | 1,410,883.33 | |
| .............. | 411,346.09 | |
| .............. | 354,900.00 | |
| .............. | 1,444,388.30 | |
| .............. | 95,035,663.33 | 95,035,663.33 |
| .............. | 26,569,307.46 | |
| .............. | 76,126,235.23 | |
| .............. | 6,595,320.92 | |
| .............. | 89,875,439.80 | |
| .............. | 199,166,303.41 | 199,166,303.41 |
| .............. | 31,332,724.03 | 31,332,724.03 |
| 39 ....... | 72,875,185.22 | |
| ear ....... | 17,733,719.56 | |
| .............. | 90,608,904.78 | 90,608,904.78 |
| .............. | | **¥2,446,858,595.55** |

N OF NET PROFIT

nding March 31, 1939)

| | Net profit | Disposition |
|---|---|---|
| 39 ......... | 72,875,185.22 | |
| .............. | 17,733,719.56 | |
| .............. | | 3,650,000.00 |
| annum) .... | | 12,901,121.25 |
| .............. | | 32,000,000.00 |
| .............. | | 15,000,000.00 |
| .............. | | 500,000.00 |
| .............. | | 26,557,783.53 |
| .............. | **¥90,608,904.78** | **¥90,608,904.78** |

ns The total amount has been charged to the following accounts:

| | |
|---|---|
| Profit and Loss Accounts | 28,150,965.13 |
| Suspense Accounts | 19,390,732.15 |
| **Total** | **¥47,541,697.28** |

SOURCE: Japan-Manchoukuo Yea

## SOUTH MANCHURIAN RAILWAY SUBSIDIARY COMPANIES

| Classification | Name of Firm | Location of Head Office | Established | Capital | | South Manchurian Shares | |
|---|---|---|---|---|---|---|---|
| | | | | Authorized | Paid Up | Executed | Paid In |
| Industry | Nippon Refined Wax Co. | Dairen | Feb. 1929 | 4,000 | 4,000 | 4,000 | 4,000 |
| | Dairen Ceramic Ind. Co. | " | July 1925 | 1,200 | 1,200 | 1,200 | 1,200 |
| | Manchuria Chem. Ind. Co. | " | May 1933 | 26,000 | 26,000 | 12,925 | 12,225 |
| | Dairen Ind. Co. (Timber) | " | Apr. 1918 | 1,000 | 1,000 | 508 | 508 |
| | Fushun Cement Co. | Fushun | Apr. 1934 | 7,500 | 6,875 | 3,750 | 3,125 |
| | Daiman Gold Mining Co. | Changchun | June 1934 | 200 | 50 | 200 | 50 |
| | Fushun Mining Co. | Fushun | Aug. 1937 | 2,000 | 1,250 | 1,000 | 625 |
| Business | Yinkou Water Supply Co. | Yinkou | Nov. 1906 | 1,000 | 1,000 | 660 | 660 |
| | Nichi-Man Trading Co. | Changchun | Dec. 1939 | 60,000 | 40,000 | 30,000 | 20,000 |
| Farming and Real Estate | Dairen Agricultural Co. | Dairen | Apr. 1929 | 10,000 | 5,000 | 10,000 | 5,000 |
| | Man-Sen Pillar Company | Antung | Dec. 1919 | 1,500 | 1,500 | 1,500 | 1,500 |
| | Manchuria Real Estate Co. | Fentien | Oct. 1937 | 20,000 | 15,000 | 20,000 | 15,000 |
| Communication | Dairen Steamship Co. | Dairen | Jan. 1915 | 25,700 | 25,700 | 25,700 | 25,700 |
| | Dairen City Traffic Co. | " | May 1926 | 15,000 | 12,500 | 15,000 | 12,500 |
| | Kokusai Transportation Co. | " | Aug. 1926 | 15,000 | 12,000 | 15,000 | 12,500 |
| | " " " | " | Aug. 1926 | 100,000 | 78,700 | 53,000 | 53,200 |
| | Fukusho Labour Supply Co. | " | Oct. 1926 | 1,800 | 1,800 | 1,800 | 1,800 |
| | Nichi-Man Warehouse Co. | Tokyo (Japan) | May 1927 | 15,000 | 15,000 | 7,500 | 7,500 |
| | Dairen Dock & Eng. Co. | Dairen | Aug. 1937 | 4,500 | 4,500 | 4,500 | 4,500 |
| Others | Manchuria Mining Co. | Fentien | June 1938 | 10,000 | 7,500 | 10,000 | 7,500 |
| | Tangkangtsu Hot Spring Co. | Tangkangtsu | Mar. 1920 | 1,000 | 250 | 505 | 126 |
| | Manchuria Industry Promotion | Changchun | Dec. 1937 | 5,000 | 5,000 | 2,500 | 2,500 |
| | Toa Civil Engineering Co. | Fentien | Jan. 1920 | 5,000 | 1,250 | 2,510 | 627 |
| | Kantoshu Ground Const. Co. | Dairen | Aug. 1939 | 10,000 | 5,000 | 5,000 | 2,500 |
| | Manchuria Movie Assn. Co. | Changchun | Aug. 1937 | 9,000 | 8,500 | 4,500 | 4,250 |

SOURCE: Information obtained from "Economical Review of Northeastern District of China" (page 54).

**Appendix 6-b**

| Assets | | Amount<br>Details | Total |
|---|---|---|---|
| **Subscribed Capital Stock Uncall** | 000,600 shares | 100,000,000.00 | |
| **Fixed Assets:** | 000,000 hares | 400,000,000.00 | |
| Railway and Equipment ...... | | 800,000,000.00 | 800,000,000.00 |
| Harbours and Wharves ..... | | 696,208,000.00 | |
| Collieries and Equipment .... | | 103,792,000.00 | |
| Oil Distillating Plant ....... | | | |
| Coal Liquefaction Plant .... | | | |
| Iron Plant ................ | | | |
| Facilities and Equipment not | | 47,990,000.00 | |
| Offices ................ | | 210,900,000.00 | |
| Employees' Dwellings .... | | 20,000,000.00 | |
| Miscellaneous .......... | | 278,890,000.00 | 278,890,000.00 |
| **Total Fixed Assets** .. | | | |
| **Investments:—** | | | |
| Bonds and Shares: | | | |
| Imperial Japanese Governme | | 951,825,000.00 | 951,825,000.00 |
| Manchoukuo Government | | | |
| Bonds .............. | | | |
| Shares of Subsidiary Compa | | | |
| Other Bonds, Shares, etc. | | 48,350,000.00 | |
| **Loans:** | | 42,961,545.61 | |
| Loans to Manchoukuo Go | | 102,600.00 | |
| Railways ........... | | 1,410,883.33 | |
| Loans to Other Concerns . | | 411,346.09 | |
| **Total Investments** .. | | 354,900.00 | |
| **Current Assets:—** | | 1,444,388.30 | |
| Cash in Hand and at Banks | | 95,035,663.33 | 95,035,663.33 |
| Bills Receivable ......... | | | |
| Exchange Accounts ........ | | | |
| Accounts Receivable ....... | | | |
| Guaranty Funds ......... | | 26,569,307.46 | |
| Collateral Securities, etc. ... | | 76,126,235.23 | |
| Due from Other Concerns .. | | 6,595,320.92 | |
| Inventories:— | | 89,875,439.80 | |
| Merchandise:—Coal and Ot | | 199,166,303.41 | 199,166,303.41 |
| Material and Supplies .... | | | |
| **Total Current Assets** | | | |
| **Unadjusted Accounts:—** | | | |
| Partial Payments made in Ad | 39 | 31,332,724.03 | 31,332,724.03 |
| Discount on Bonds ........ | ear | 72,875,185.22 | |
| **Total Unadjusted Acc** | | 17,733,719.56 | |
| **Total Assets** ....... | | 90,608,904.78 | 90,608,904.78 |
| | | | **Y2,446,858,595.55** |

N OF NET PROFIT

nding March 31, 1939)

| Remarks | | Net profit | Disposition |
|---|---|---|---|
| | (f 39 ........ | 72,875,185.22 | |
| | ........ | 17,733,719.56 | |
| | ........ | | 3,650,000.00 |
| **Railway** ........... | nnum) .... | | 12,901,121.25 |
| **Harbours and Wharves** ...... | ........ | | 32,000,000.00 |
| **Collieries** ............ | ........ | | 15,000,000.00 |
| **Oil Distillation** ......... | ........ | | 500,000.00 |
| | ........ | | 26,557,783.53 |
| | ........ | **Y90,608,904.78** | **Y90,608,904.78** |
| **Generals** ............ | has been charged to the following | | |
| **Interest** ............ | | | |
| **Depreciation, Depletion, etc.** . | Profit and Loss Accounts | | [illegible] |
| **Net Profit** ........... | Suspense Account | | [illegible] |
| **Total** ............. | Total | | [illegible] |

**SOURCE: Japan-Manchoukuo Yea**

# MUKDEN MAIN ARSENAL

**Location:** Eastern District of the City of Mukden, Manchuria

**Date Visited:** 17 June 1946

**Product:** Bayonets, Rifles, Machine Guns, Light Artillery,
Cannon and Mortar Ammunition, Small Arms Ammunition

The Mukden Main Arsenal was constructed more than thirty years ago and is the largest plant on the mainland of Asia manufacturing arms and ammunition.

The plant is located in the eastern section of the City of Mukden and covers a very extensive area. The various buildings which amount to 242 in number are well constructed of brick or concrete. The Arsenal has its own central power plant to provide electricity and heat.

Originally the Germans had much to do with the planning and equipping of the Arsenal and much German equipment of old design was in use. However, in more recent years the additions and alterations as well as the expansion of the Arsenal were based largely on the use of Japanese equipment.

It was noted that the loading equipment for small arms ammunition was of English manufacture and it was explained by Mr. Ku, Manager of the Arsenal, that the best loading equipment which was of German and Japanese origin, had been removed by the Soviets and only the old English equipment remained.

The plant showed some damage from aerial attack and it was explained that this was a result of a raid in December of 1944 by American B-29 bombers which resulted in severe damage to six buildings and minor damage to a few others. It was stated, however, that the capacity of the Arsenal was not seriously reduced by those raids.

The writer recalls particularly that in one of their newer steel and concrete buildings which suffered from a direct hit of an aerial bomb there was severe damage to some of the machine tools caused by the fragments of the bomb. As a matter of fact, this particular hit was an outstanding and exceptional example of damage done to machinery by aerial bombs, as in other plants visited the direct damage to the equipment was as a rule either nil or very minor.

According to the figures of the Chinese management of the Arsenal, the annual capacity prior to August 15th, 1945 was as follows:

| | |
|---|---|
| Bayonets - | 120,000 |
| Rifles - | 24,000 |
| Machine Guns - | 1,680 |
| Mountain Guns - | 600 |
| Shell - | 720,000 |
| Small Arms Ammunition - | 54,000,000 |
| Hand Grenades - | 360,000 |
| 82 mm. Mortars - | 600 |
| 75 mm. Anti-Aircraft Guns - | 120 |

According to the statement of Messrs. Ku and Mon, the Chinese managers of the Arsenal, there were removed during Soviet occupancy 15,900 pieces of equipment representing about 20% of the total available equipment and in value roughly $2,000,000 in United States dollars.

The figure of 15,900 units includes, according to my understanding, not only the machine tools and heavy industrial equipment such as electric furnaces, compressors, woodworking machinery, but testing devices and items such as electric fans, sewing machines, motors, etc.

As the Japanese records indicate that as of August 15th, 1945, the Arsenal contained 9,560 major items of equipment including machine tools and industrial machinery and had on hand 18,000 tons of raw material.

The Chinese record states that the material removed by the Soviet forces amounted to 14,350 tons of the United States dollar value of $3,067,500.00.

Of the 9560 major items of equipment there were removed during Soviet occupancy 3,000 items mostly machine tools and there remained approximately 6000 items.

It was noted that in the department which housed the rolling mill for rolling sheet brass for ammunition components, an opening had been made in the wall and the rolling mill removed. The electric brass furnaces were removed and only the coal-fired furnaces remained.

In view of the fact that the Mukden Arsenal is one of the oldest Arsenals in Asia, there was much old equipment evidenced by the fact that a large percentage of the remaining equipment was belt driven.

The removals made by the Soviet forces were highly selective and for the most part they removed the modern equipment and all belts from the old equipment together with all electrical equipment.

From information furnished by the Chinese Manager, Mr. Ku, and from notes available in the report of Captain Ross, who made an earlier inspection for the Pauley Mission, the following is a general statement of the removal of equipment during Soviet occupancy:

| | | | |
|---|---|---|---|
| Factory #1 | - | 1,053 | Machines |
| " #2 | - | 225 | " |
| " #3 | - | 558 | " |
| " #4 | - | 276 | " |
| " #5 | - | 543 | " |
| Apprentice School | - | 80 | " |
| Testing Laboratory | - | 33 | " |

The above removal took place prior to January 27, 1946 and totaled 2768 machines.

Between the period January 27th and March 7th, 1946, further removals were made by Soviet forces amounting to 536 machines, making a total removal of 3304. The figures given include not only machine tools, but heavy industrial equipment, electric furnaces, compressors, testing equipment, etc.

The Chinese authorities further stated that practically all of the small tools and accessories were taken by Soviet forces and these amounted to about 150,000 items.

Aside from the removals and damaged buildings occasioned by the removal of equipment, and the damage occasioned by the areial bombing, the buildings were in reasonably good condition and the Chinese management had in the neighborhood of 600 employees in the Arsenal including 200 Japanese at work rehabilitating the plant and equipment.

The greatest activity seemed to be in connection with the equipment for the manufacture of small arms ammunition as technicians were working on the loading machines and work had been started to recondition the cartridge drawing presses, bullet forming machines. However, as mentioned above, all of the latest type of small arms ammunition equipment had been removed by the Soviets and only the older machines remained. These, as previously mentioned, were generally of British origin.

A tour through the principal departments of the Arsenal indicated that in addition to the manufacture of the 3" anti-aircraft artillery, the plant was also being used to repair and recondition field artillery.

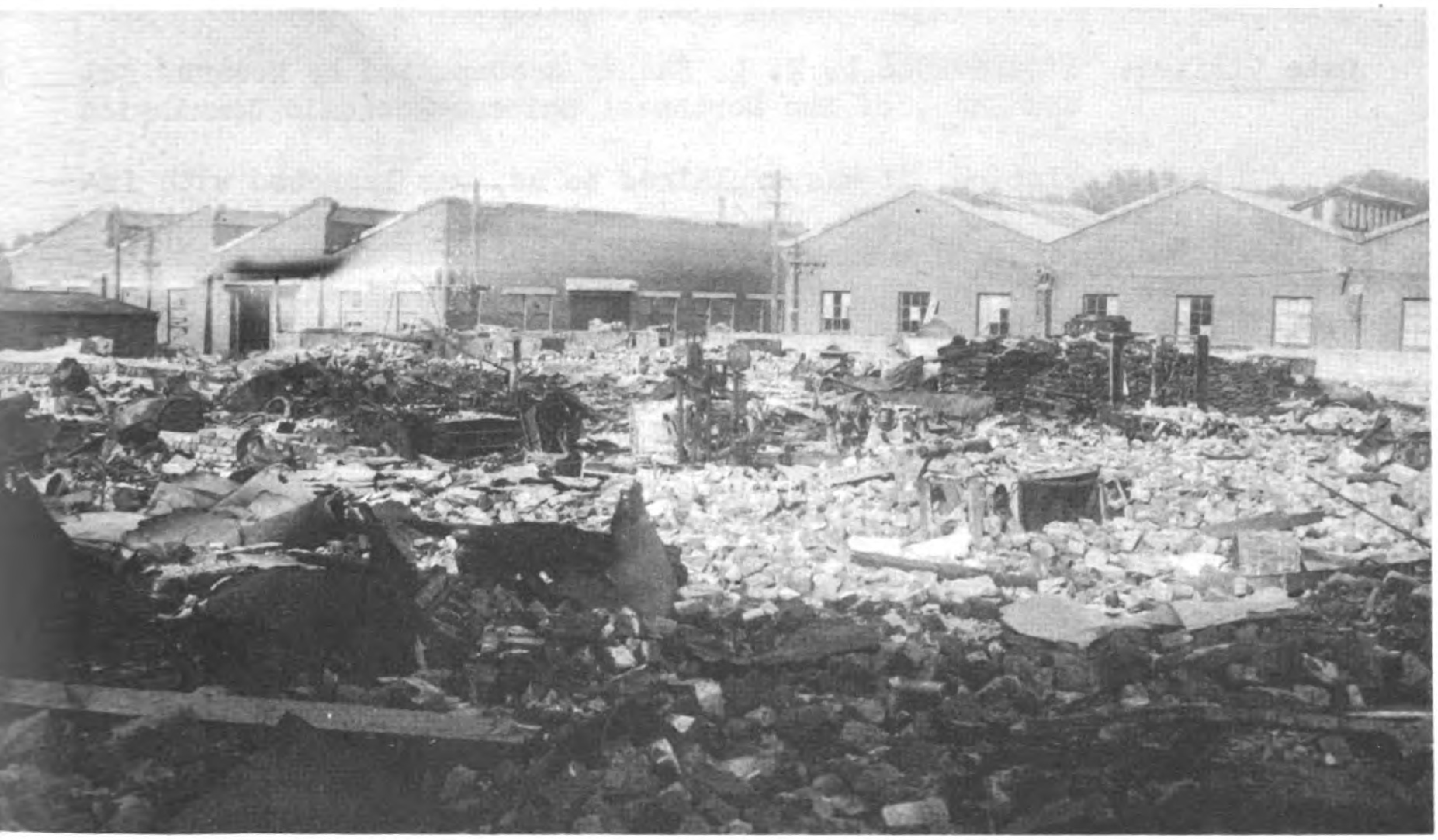
The hydraulic piercing and drawing presses, together with the hydraulic pumps and accumulators used for the drawing of shell forgings were still in place, but the method used and the quality of the product produced was decidedly inferior to the practice in the United States. Likewise, it was noticed in the department manufacturing bayonets that the methods were extremely crude as were also the bayonets being produced. As a matter of fact, the quality of the bayonet was an indication of the deterioration of the Japanese army in the production of military equipment.

While it is difficult to actually appraise a plant after it has stood idle for a long time and has been subjected to bombing and pillaging, still there were many departments such as departments manufacturing grenades, bayonets, etc., which had not been disturbed either by bombing or by the Soviet forces and in these departments the poor housekeeping and generally inferior methods employed were evidence of the deterioration of the plant under the Japanese management.

Despite the fact that much equipment remained, the approximately 3000 major items of equipment removed by the Soviet forces, as well as the tremendous tonnage of raw material reduced the capacity of the plant approximately 80 per cent.

PREPARED BY

A. B. Einig



Damage to airplane factory in Mukden due to B-29 attack in 1944. Picture taken June 1946. Outside of this and a small amount of damage in Anshan, the Pauley Mission found no other evidence of B-29 raids.

## MANCHU SHARYO K. K.
(Manchurian Locomotive Works)

**Location:** Near the industrial district of Letsunishiku, Mukden.

**Date Visited:** 1 June 1946 by E. L. Shaner accompanied by Messrs. Lui and Shao, of the Northeast Chinese Economic Commission

This installation, it was explained to us, was launched with inadequate capital. After the buildings were erected, insufficient funds remained for purchasing the most desirable equipment and consequently considerable second and third-hand machinery was acquired. This may explain the fact that many of the machines are 20 or more years old. I saw one locomotive tire lathe manufactured by a Meadville, Pa. company that discontinued building this particular machine at least 25 years ago.

The works is well laid out, with large erecting shop and the usual complement of boiler shop, blacksmith shop, machine shop, car shops, wood-working shop, transfer tables, paint shop and foundry.

In contrast to all of the other plants inspected by this writer in Manchuria thus far (June 6), this works suffered only slightly from pillaging or other damage. About 75 machines were removed, only a few of which were vital to continued smooth operation of the plant. It may be significant that the two Heroult-type electric furnaces were left untouched, whereas every other plant in the area equipped with electric furnaces lost part or all of their furnaces. The explanation for this given us by the Chinese is that the Soviets wished to keep railroad motive power and rolling stock in as high a state of efficiency as possible until the equipment removals in Manchuria had been transported by rail to port. Another explanation was advanced to the effect that the Soviets were lenient in regard to the Locomotive Works because they left it in charge of White Russians and hoped thereby to retain control or possession of it. However, the Chinese took over.

The plant was geared to a locomotive building program whereby 8 locomotives were in process of building at one time. The average time of completion was about 120 days. In most respects, all practice was quite similar to that prevalent in the United States about 20 years ago. However, in my judgment, the works are capable of good work, but at less efficiency than if more modern equipment were available.

At the time of our visit there was practically no activity in the works, due to the lack of electric power. In the tool room of the machine shop we witnessed an ingenious attempt to overcome this deficiency. The management had taken a gasoline engine out of an automobile, set it up on blocks, run an exhaust line out of a window, and were fitting a belt from the engine to a countershaft, from which they intended to drive several tool grinders, a lathe and drill press.

This works can operate effectively as soon as power is available. Some revamping will be necessary to compensate for machines carried away, but to all intents and purposes, this works is practically intact.

PREPARED BY

E. L. Shaner

## MANCHURIA MACHINE TOOL COMPANY

**Location:** Mukden, Manchuria

**Date Visited:** 2 June 1946, by Norman Cleaveland and Captain Carl Ross, together with Mr. Liu of the NE Chinese Economic Commission and the former Japanese plant manager.

There was very little to observe in this factory except the absence of equipment. Everything of value was removed. A few older machines (machine tools), some stocks of replacement parts and depleted piles of steel and raw materials were all that remained.

The Japanese inventory of machine tools indicates that 577 were taken plus motors, cranes and various other heavy equipment. On the basis of inspection this is believed to be accurate. They report that the factory owned 670 machine tools plus other equipment.

Production records of this plant show her annual output to have been:

| | |
|---|---|
| Automatic lathe | 60 |
| Small lathe | 300 |
| Drilling machine (20") | 120 |
| Milling machine (#2) | 120 |

The Japanese reported that about 120 Soviet officers and men were billeted in the plant between September and November 1945. In 40 days 100 soldiers plus 200 Japanese factory employees of the plant stripped the equipment listed, crated it individually and completely, and shipped it out by rail. This was confirmed in reports from the Manchuria Machine Works (Source File 1-J-7) which adjoins this factory area. That company experienced the same billeting and stripping procedure in a 30-day period.

PREPARED BY

Captain Carl Ross

## MANSHU MITSUBISHI ENGINEERING COMPANY

**Location:** Mukden

**Date Visited:** 2 June 1946, by Messrs. Shaner and Cleaveland, Captain Ross, and Mr. Liu of the Northeast Chinese Economic Commission, and Mr. Jang, present Chinese manager.

This factory was built in 1936 with a capital of ten million yen and employed 2100 workers, 25 percent being Japanese. There are eight factory buildings plus offices, dormitories, and warehouses.

Average monthly production is listed below:

| | |
|---|---|
| Leaf and coil springs | 70 tons |
| Chemical machinery | 70 " |
| Machinery for iron and mining industries | 35 " |
| Cast iron products | 35 " |
| Light military tanks | 70 " |

Japanese managers indicate that 3500 tons of steel and 8500 tons of coal were on hand at the war's end. They report an inventory of about 600 machine tools, plus furnaces, cranes, presses and other heavier equipment, all of which, with the exception of about 30 machine tools, were removed by the Soviets.

Approximately 30 machine tools of the original 600 remained. Electric furnaces, motors and cranes were all removed, in what appeared to be an orderly and very complete stripping of a modern-type plant. Few units were left in the coil or leaf spring shops, these being in disrepair.

The Japanese and Chinese both reported quantities of special steel were removed but this could not be checked for accuracy. There were large amounts of plate steel, rods and shapes in evidence throughout this plant.

PREPARED BY

Captain Carl Ross

## MUKDEN MAIN ARSENAL

Location: Eastern District of the City of Mukden, Manchuria

Date Visited: 17 June 1946

Product: Bayonets, Rifles, Machine Guns, Light Artillery, Cannon and Mortar Ammunition, Small Arms Ammunition

The Mukden Main Arsenal was constructed more than thirty years ago and is the largest plant on the mainland of Asia manufacturing arms and ammunition.

The plant is located in the eastern section of the City of Mukden and covers a very extensive area. The various buildings which amount to 242 in number are well constructed of brick or concrete. The Arsenal has its own central power plant to provide electricity and heat.

Originally the Germans had much to do with the planning and equipping of the Arsenal and much German equipment of old design was in use. However, in more recent years the additions and alterations as well as the expansion of the Arsenal were based largely on the use of Japanese equipment.

It was noted that the loading equipment for small arms ammunition was of English manufacture and it was explained by Mr. Ku, Manager of the Arsenal, that the best loading equipment which was of German and Japanese origin, had been removed by the Soviets and only the old English equipment remained.

The plant showed some damage from aerial attack and it was explained that this was a result of a raid in December of 1944 by American B-29 bombers which resulted in severe damage to six buildings and minor damage to a few others. It was stated, however, that the capacity of the Arsenal was not seriously reduced by those raids.

The writer recalls particularly that in one of their newer steel and concrete buildings which suffered from a direct hit of an aerial bomb there was severe damage to some of the machine tools caused by the fragments of the bomb. As a matter of fact, this particular hit was an outstanding and exceptional example of damage done to machinery by aerial bombs, as in other plants visited the direct damage to the equipment was as a rule either nil or very minor.

According to the figures of the Chinese management of the Arsenal, the annual capacity prior to August 15th, 1945 was as follows:

## MANCHURIAN HITACHI WORKS, LTD.

**Location:** Mukden - Letsunishi District, West of Railroad

**Date Visited:** 2 June 1946, by Messrs. Cleaveland, Shaner, Dr. Sun, Mr. Liu, and other members of the Northeast Chinese Economic Commission.

This is a branch plant of the parent Hitachi firm which according to a catalog we saw in the office, manufactures and builds a greater variety of equipment than any company in the United States. Its products extend into all the lines covered in the United States by General Electric Company, Western Electric Company, Ingersoll-Rand, Allis-Chalmers Manufacturing Company, American Locomotive Company, Wellman Engineering Company, a partner of Dupont, and others.

The Mukden plant makes gray iron, malleable and steel castings and machines them for railroad freight cars. It also builds cranes, windlasses, air compressors and other equipment. It employed more than 1,100 workers prior to August 15, 1945.

The principal equipment of the plant consisted of six 3-ton electric arc furnaces, 3 cupolas, 2 tunnel-kiln annealing furnaces for malleable iron, molding machines and other foundry equipment for steel, malleable and gray iron castings, cranes and machine tools.

This was the first plant in which we had found a malleable iron foundry. We had expected to find one or more air furnaces of the type used for malleable in the United States. From replies to questions, it appears that malleable iron was made from cupola iron. The annealing cycle, which was said to conform to the 48-hour practice, was carried on in a tunnel kiln of conventional design. A second tunnel kiln is new, never having been used. Both kilns are intact.

The damage reported in Report No. 13 (Source File 303-J-1) of the Assistant Military Attaché at Mukden is probably correct in the main, although it is difficult to identify the exact kinds of furnaces from the general terms in the report—such as "smelting furnace", "alloy furnace", and "pig iron furnace". However all but one electric arc furnace, eight overhead cranes, at least 150 machine tools, practically all electrical equipment, all wood-working machines, some molding machines and air compressors, and other equipment were removed by the Soviets. Some of the electric motors and almost all of the factory tools were carried away by the Chinese looters.

Average monthly production of this plant was reported to be as follows:

| | | | |
|---|---|---|---|
| Castings for railroad freight cars* | | 350 | tons |
| Other castings* | | 50 | " |
| Cast steel parts | | 65 | " |
| Ordinary cast iron parts** | | 60 | " |
| Water pumps | (number) | 11 | |
| Windlasses | " | 9 | |
| Air compressors | " | 1 | |
| Other machines | (value) | 30,000 | yen |
| Motors | (number) | 100 | |
| Insulating varnish | | 35 | tons |
| Mixers | | 8 | " |
| Insulating cloth | | 20 | kg. |
| Mica sheets | | 3000 | sheets |

* It is believed that this refers to malleable iron castings, mostly journal boxes and hangers for high tension power lines.

** Gray iron castings, mostly for pumps, compressors and machines.

With the loss of electric furnaces, this plant is reduced to the status of a gray iron foundry dependent upon the cupolas. Whether the practice could be adapted so that iron from cupolas, without use of electric furnaces, could be used for malleable could not be determined from information available to the Mission. In any event, considerable replacement of cranes, electrical equipment and other essentials would be necessary before operations could be resumed even on a limited basis.

NOTE: Numerous instances were observed in which heavy foundation bolts were bent over. This required time and effort and raises the question whether motive was to make it more difficult to install replacement equipment on old foundations.

PREPARED BY

E. L. Shaner

# MANCHURIA KOGAKU COMPANY

(Optical Instrument)

This company was organized about 1935 and the factory built to produce binoculars and various optical instruments for weapons. The entire plant is housed in one large 3 story sturdily constructed concrete building. It was inspected by Mr. Shaner, Mr. Cleaveland and Captain Ross on June 2, 1946 together with Mr. Liu of the Northeast Chinese Economic Commission.

Data is not available to indicate the former inventory of this factory, but it was evident that it had been stripped of all valuable equipment with the exception of its lens grinding department. The latter part of the factory was not stripped, but had lost only its electric motors and precision testing instruments. No stocks of raw materials were observed in the area but it could not be determined whether these had been removed by the Soviets or pilfered by others.

PREPARED BY

Captain Carl Ross

## MANCHU MACHINE WORKS
## (Also Manchu Iron Works)

**Location:** Mukden

**Date Visited:** 2 June 1946 by Captain Carl Ross and Norman Cleaveland, in company with Dr. Sun.

This plant produced freight cars, steam engines, steel drums and general heavy machine work. We were shown through the plant by the Japanese plant manager. He spoke little English and as we had no Japanese interpreter all questions and answers were interpreted through the Chinese language. In general this plant was thoroughly stripped and only tools of very doubtful value remained. On the other hand there were, like in other similar plants, ample supplies of steel shapes and plates stored in various parts of the plant, including partially completed products.

The plant had consisted generally of a steel foundry with electric furnaces, a forge shop, machine shop, steel drum making shop, a woodworking shop, assembly shops, oxygen producing plant and a testing laboratory.

The bulk of the buildings for this plant predate the Japanese occupation but are substantial and adequate construction. One storehouse which housed some Soviet Troops burned down on the last night of their occupation.

If higher Soviet commanders issued any orders to the effect that care should be taken in the removal of equipment to prevent unnecessary damage of remaining installations such orders were not strictly adhered to.

There was not much evidence of general looting or mob violence, and it was reported that there had been little of that after the Soviets removed the plant installations. The Soviet soldiers sold the supplies of coal, coke, office supplies, furniture and some small tools to local Chinese who were permitted in the plant to load their purchases.

We were supplied with a list of equipment and materials that had been removed by the Soviets. This list appears to be correct. The summary list furnished by the Northeast Economic Commission lists this plant as 100% stripped and 100% inoperative. I would say 90% stripped and 100% inoperative.

PREPARED BY

Norman Cleaveland

Appendix 7 Plant Inspection Report 1-3-8

## FUSHUN MINES MACHINERY WORKS

Location: Fushun

Date Visited: 3 June 1946 by Capt. Ross together with the former Japanese and present Chinese managers.

It was reported that 2,000 men were presently employed at this plant producing and repairing mining equipment and rolling stock.

A list of equipment removed by the Soviets was obtained and checked for accuracy. This was especially interesting because a relatively large proportion of good machine tools, furnaces, cranes, etc. were left intact by the Soviet troops. For example while the Soviets removed two electric furnaces, they left three, including one 6 and one 4 ton in good condition. No overhead cranes were removed, no woodworking machines, no small tools, etc.

While the actual removals did throw the plant out of balance and reduce capacity, it is believed to be the largest machinery factory capable of operating in Manchuria. No satisfactory explanation of the Soviets' failure to take more good equipment can be given than that they expected to be drawing upon the Fushun Mines for coal at a later date.

PREPARED BY

Capt. Carl Ross

## MEDAL ELECTRIC LAMP MANUFACTURING COMPANY

Location: Fushun

Date Visited: 4 June 1946

This is a small primitively designed factory capable of producing 1,000 - 50 and 100 watt bulbs a day. It recently was taken over by the Fushun coal mines since the bulk of its production is used in the pits. The balance of the output goes into local channels in the neighborhood of Fushun.

No machinery was removed from this factory, the most likely reason is the age and dilapidated condition of equipment. Workmanship was poor in both the glass bulb and the heating element. Children of about 15 constitute the bulk of the working force which totals between 50 and 60. It is interesting to note that this small company experienced no shortage of brass or tungsten.

PREPARED BY

Capt. Carl Ross

## NO. 918 WENKUANTUN ARSENAL

Location: 10 miles north northeast of Mukden

Date Visited: 7 June 1946

Date Put in Operation: This is a new plant established about 1938 and was still under development when dismantled by the Soviets.

Product: Tanks, tractors, artillery, and mortar shells; aerial bombs, sabers, and airplane parts.

Production: Annual production before August 15, 1945 was 40 tanks, 240,000 shells, plus other items as listed before.

Outline of Plant Equipment: The buildings which made up the manufacturing plant were of brick construction with steel columns and trusses with wood and tile roofs. There are 36 main manufacturing and 33 storage buildings in the manufacturing area. The total number of buildings was 700, including officers' quarters, living quarters for supervisory staff and barracks. The buildings inspected included the following:

(1) Storage for tank and tractor parts. Finished parts were not removed by the Soviets. Minor damage to the building.

(2) Tool room of about 4,000 square meters, 50 meters by 80 meters. Here were produced tools, cutters, jigs, gauges, etc., and there were 60 - 70 precision machine tools all motor driven. All were removed by the Soviets. The six-cylinder Diesel engines for tractors were made in three buildings.

(3) Building was of 4,700 square meter floor space and contained the equipment for finishing the cylinders, the crankshaft and camshaft amounting to about 500 machine tools. All were removed by the Soviets.

(4) The assembly plant, was a building of 4,700 square meters and 40 machine tools required for service were removed.

(5) General machine shop--a building of 4,700 square meters, from which 100 machines were removed.

(6) Gear department, in a building of 4,700 square meters containing 120 machines of which all were removed.

(7) Forge shop, occupied 4,700 square meters from which 15 pieces of equipment were removed.

(8) Heat treating department, 60' x 175' — no important removals.

(9) Foundry, 100' x 200' — two 3-ton cupolas and two 1/2-ton cupolas not removed. Removed one 1-ton cupola and one 1-ton electric furnace as well as six 250 kg high frequency furnaces.

(10) Building 3,000 square meters for care and storage of mortar shells.

(11) Forge and press room, 30 meters by 50 meters, all equipment except gas fired furnaces removed.

(12) Forge shop for shell forgings — equipment removed consisted of three 300-ton and three 200-ton hydraulic presses. Large stock (200 tons approximately) of 5" square shell stock in building.

(13) Building—weight type accumulators in place. Three hydraulic pump units with electrical equipment removed, together with valves and recording equipment.

(14) Fuse plant destroyed by fire — probably not of Soviet origin.

(15) All buildings in loading area destroyed by Soviets.

(16) Storage building for machine tools destroyed after removal of machine tools by Soviets.

(17) Ammunition dump and storage blown up by the Soviets.

No. of Employees: The average employment prior to August 15, 1945 was 7,000 workmen with a maximum of 10,000 including apprentices, boy scouts, and technical soldiers—all Japanese. There were also employed about the place some 3,000 Chinese as laborers, transport workers and repairmen on the buildings and houses.

Removals: According to the Chinese figures, the statement of the Japanese engineer, Mr. Ku of the Mukden Main Arsenal and General Yuan of the Wenkuantun Arsenal, the plant had 1,700 machine tools and pieces of metal working equipment of which 300 were considered scrap and were out of commission and the Soviets removed 1,324 pieces of equipment, along with 6,700 tons of high speed and alloy steel and 1,300 tons of copper. These removals occurred during the period August 20, 1945 to November 14, 1945, and from the 9th of December 1945 to March 6, 1946. The material and equipment removed by the Soviets amounted to 15,000 truck loads totaling 45,000 tons and three thousand railroad carloads totaling 100,000 tons. The Soviets used 500 - 1,000 Japanese prisoners to load material and equipment.

The destruction of the loading plant and storage dump occurred about March 6, 1946, and resulted in considerable damage to other structures over a wide area. Most of the main buildings are reparable and the damage is limited to roofs, glass and other general repairs.

As the primary object of this arsenal was the production of arms, ammunition, and armament the rehabilitation of the plant would require the complete restoration of all buildings and equipment either destroyed or removed by the Soviets.

Trucks and tractors could be made by reequipping the sections of the plant devoted to that work.

The raw materials for the manufacture of military material came from Japan and Anshan (Manchu Iron Works) could furnish ample iron and steel for the truck parts except where high alloy steel is required.

At least 1,000 tons of low carbon steel billets, blooms, and bars are stored at the arsenal. General Yuan is now commandant of the arsenal. Total removals by the Soviets amounted to about 95 per cent of the manufacturing equipment and reduced the productive capacity 100 per cent.

PREPARED BY

A. B. Einig

## MANCHU OTANI HEAVY INDUSTRY COMPANY

**Location:** Anshan. Northeast of center of Manchu Iron Company.

**Date Visited:** 12 June 1946

**Product:** Ingot molds, rolls, general machinery, plate, rod and oxygen.

**Source of Material:** Manchu Iron Company

**Source of Power:** Electric Grid, Primary Station, Manchu Electric Company

**Power Requirements:** 3500 KW

**Number of Employees:** 300

**Destination of Product:** Manchu Iron Works and Manchurian Railway Company

**Equipment:** The equipment of the general machine shop included the following machine tools:

6 Planers
1 Level Gear Generator
5 Gear Hobbing Machines up to 60" capacity
7 Shapers
7 Horizontal Knee Type Milling Machines
2 20" Column 7' Arm Radial Drills
7 Slotters
40 20—30" Swing Engine Lathes
30 Roll Lathes of 30" Swing
3 Punches
4 Steam Hammers
8 5' Arm Radial Drills

The Soviets removed no machine tools but took lathe chucks and 218 motors. Chinese Communists took belting. Crane capacity, 4 cranes maximum 15 tons.

The equipment in the foundry included the following:

3 Cupolas of 10-ton capacity each
2 Cranes of 50-ton capacity each
2 25-ton capacity cranes each
1 8-ton electric furnace
2 Reverboratory furnace of 35-ton capacity each
2 100# Compressors

No equipment was removed by the Soviets from the foundry but a pump motor was missing, oil was removed from transformers and switchboard instruments and switches were broken and removed by parties unknown.

Time required to place plant in operation depends on the delivery of miscellaneous items such as switches, instruments, and other accessories.

As a separate department this company operated a three high two thousand horse power plate mill for rolling ordinary plate from 6 mm. to 22 mm. thickness and up to a width of six feet.

Slabs for this operation were obtained from Manchu Iron Company.

The rolling mill also included the following equipment:

1 Hot shear of 75 mm. capacity by 4½' wide
1 Plate shear capacity 22 mm. x 72"
1 Plate shear with capacity to shear plate up to 27 mm. thickness by 10' wide
3 Cranes of 15-ton capacity each

Transformer and control equipment is in good condition except for broken switchboard instruments. It was stated that the Soviets removed 2,000 tons of finished plate about November 1945 requiring one month and 50 cars.

The plant also has a small three high rod mill with a 200# motor drive. The mill and drive is in operating condition except for switchboard instruments.

The Plate and Structural Shop has the following equipment in place:

1 Plate shear capacity 22 mm. x 4'
1 Double end punch and shear
1 100# compressor
1 50# compressor
1 ½-ton air operated flat dice forging hammer
1 ½-ton steam hammer
1 1-ton steam hammer
2 Traveling cranes of 5-ton capacity each

It was stated by the Otani officials that the Soviets removed one pyramid type bending roll with capacity for handling plate up to 16 mm. thickness x 10' wide and electrical equipment together with six motors of from 5 to 10 HP rating.

The Oxygen Plant is intact as it was operated by the Soviets and the removals consisted of motors from 5 to 10 HP and 200 flasks of oxygen.

The buildings of the plant are all in good condition and the total removals by the Soviets according to available information were as follows:

Lathe chucks and 218 motors from the machine shop.
2,000 tons of plate
1 pyramid type bending roll complete with electrical equipment
200 steel bottles of oxygen and miscellaneous motors under
ten horsepower

The guide on the inspection was formerly a research engineer of the Manchu Iron Works and an operating official of the Manchu Otani Heavy Industry Company.

Decrease in capacity due to removals of machine tools and supplementary equipment 10--15%.

PREPARED BY

A. B. Einig

# MANCHU MACHINE COMPANY
## (Anshan Numata Machinery Company)

Location: Anshan, 1/2 mile south of railroad station

Date Visited: 13 June 1946

Product: Narrow gauge steam locomotive, narrow gauge rolling stock, steam boilers, belt conveyors.

Number of Employees: 400

Source of Material: Manchu Iron Works, Anshan, Sumitomo, Mukden.

Distribution of Product: Mines

Office or building demolished by mobs.

Assembly floor for locomotives not completed, space 1,000 square meters.

Machine Shop 550 square meters. Twenty machine tools taken by Communists. Remaining tools in place five shapers, five 24" x 5' center engine lathes, two 21" stationary head upright drilling machines. Total number of machine tools in place before raids by Chinese Communists 35. Two air compressors in place but electrical equipment was taken by Communists. Control panel was wrecked by mob.

Soviets are reported to have taken 300 tons of steel.

Plate Shop has an area of 1,000 square meters. Machines in floor include hydraulic forming press, punches, plate shear with 18" blade, 10' plate planer, 4" angle shear, 3-four-foot arm radial drills, three 21" stationary head upright drills, one pyramid type bending roll for plates up to 25 mm. thick eight foot wide. Chinese Communists took the electrical equipment and mobs took the spindles of the drilling machines. There also remained two 15-ton winches.

Capacity of this plant before damage by mobs and Chinese Communists 10 locomotives per month, 10 water turbo boilers per month and 500 mine cars per month. Mine cars largely an assembly job. Parts from subcontractor.

Decrease in production capacity due to destruction by Communists and mobs 50 per cent. Guide for inspection a Japanese research engineer of Manchu Iron Works Company.

PREPARED BY

A. B. Einig

## MANCHU IRON COMPANY
(General Machine Shop and Maintenance Department)

**Location:** Anshan--north end of Manchu Iron Company near East Gate.

**Date Visited:** 13 June 1946

**Product:** Repair and maintenance of mechanical equipment of Manchu Iron Company.

| **Total Number of Employees in 1944:** | | |
|---|---|---|
| | 1,225 | Japanese |
| | 5,935 | Chinese |
| | 7,160 | Total |

The figures covering employment and equipment include not only the general machine shop but also men and equipment throughout the plant charged to the general machine shop.

The following tabulation covering equipment was furnished by the engineers of the Manchu Iron Company and the Northeast Chinese Economic Commission.

| MACHINES | NUMBER BEFORE REMOVALS | NUMBER TAKEN: SOVIETS | NUMBER TAKEN: COMMUNISTS |
|---|---|---|---|
| Lathes | 141 | 59 | 42 |
| Radial Drilling Machines | 26 | 11 | 0 |
| Upright Drilling Machines | 59 | 0 | 45 |
| Planers | 15 | 7 | 3 |
| Slotters | 17 | 11 | 3 |
| Shapers | 18 | 8 | 4 |
| Turning Lathes | 4 | 3 | 0 |
| Facing Lathes | 9 | 4 | 0 |
| Internal Boring Machines | 7 | 5 | 0 |
| Gear Hobbing Machines | 17 | 12 | 0 |
| Bevel Gear Shapers | 2 | 1 | 0 |
| Milling Machines | 18 | 12 | 2 |
| Wood Lathes | 10 | 0 | 3 |
| Turning Machines | 9 | 0 | 6 |
| Wood Planers | 6 | 0 | 4 |
| Bolt Cutters | 3 | 2 | 0 |
| Steam Hammers | 9 | 5 | 0 |
| Tool Grinders | 46 | 3 | 40 |
| Plate Bending Machines | 5 | 0 | 0 |

| MACHINES | NUMBER BEFORE REMOVALS | NUMBER TAKEN: SOVIETS | NUMBER TAKEN: COMMUNISTS |
|---|---|---|---|
| Punching and Wearing Machines | 5 | 0 | 0 |
| Electric Winches | 36 | 20 | 0 |
| Locomotive Cranes | 16 | 6 | 0 |
| Electric Welding Units | 94 | 0 | 64 |
| Portable Electric Drills | 109 | 0 | 109 |
| Electric Furnaces | 4 | 2 | 0 |
| Cupolas | 9 | 0 | 0 |
| Air Compressors | 30 | 0 | 0 |
| Overhead Cranes | 29 | 9 | 0 |
| Gantry Cranes | 2 | 1 | 0 |
| Small Tools | ? | 60% | 40% |
| Motors | 607 | 63 | 544 |
| Hydraulic Press | 1 | 1 | 0 |

Inspection of the general machine shop showed clear evidence of the removal of a large number of machine tools and the table given above is the only information available concerning the probable responsibility for the removals.

A check of the equipment still in the building showed the following machines still in place. One heavy horizontal milling and facing machine of the table type, one 4 inch bar table type horizontal boring machine, one 48 inch vertical boring mill, four 24 inch shapers, one 36" x 12' centers triple geared engine lathe, one 36" x 20' center triple geared engine lathe, one 50" horizontal facing lathe, one 30" x 16' centers geared head lathe, one 42" x 16' geared head lathe, three 30" x 12' centers lathe with 9" hole through spindle, one 36" hobbing machine, three 24" hobbing machines, one 72" hobbing machine, twelve 24" upright drilling machines, one 10" slotter, twenty-five 18" x 4' centers engine lathes, one 36" x 36" x 12' planer, one 48" x 48" x 12' planer, one 48" x 48" x 10' planer, one 30" x 30" x 8' planer, one 12" slotter, one No. 2 Universal milling machine, one 42" x 42" x 8' planer, four old 5' arm radial drills, one 12" level gear shaper, one 48" turning lathe (dismantled), one 8" slotter, one 72" lathe (dismantled), one 4' plain radial and other miscellaneous equipment.

A check of the equipment still in place with the list given above indicates that the figures given on removals were reasonably accurate considering that all of the equipment was not necessarily located in this particular building.

The rails, ties, etc. of a temporary siding used for the removal of the equipment were still in the building and much equipment had been moved to the main door of the building, cleaned and slushed with grease as well as dismantled apparently ready for removal. From a purely numerical standpoint the Soviets took about one-third of the machine tools and the Chinese Communists took about one-third. However, the tools taken by the Soviets were the heavier, more critical units and those taken by the Communists were the lighter and more readily transported. It is estimated that the capability of the machine shop to keep the steel plant in operation was reduced 75 per cent by the removal of the heavy machine tools by the Soviets.

The guide was a former research engineer of the Manchu Iron Works.

PREPARED BY

A. B. Einig

Appendix 7 Plant Inspection Report 2-J-4

## LINOYO MACHINE WORKS

**Location:** Liaoyang - 1 mile southeast of Station

**Date Visited:** 10 June 1946

This is a small general machine shop formerly operated as a proprietorship but has been taken over by the Northeast Chinese Economic Commission as a repair and maintenance shop for the repair of the equipment in the plant of the Manchu Cotton Spinning and Dyeing Company and perhaps some jobbing work.

**Employees:** Formerly 70 Chinese in the shop; 5 Japanese on the staff.

**Operation:** Not operating due to lack of electric power.

**Equipment:** Equipment included the following:

| | |
|---|---|
| 2 | 20" x 4' center engine lathes |
| 4 | 16" x 4' C. C. engine lathes |
| 1 | 16" x 3' C. C. engine lathe |
| 1 | 14" x 3' C. C. engine lathe |
| 1 | 36" hobbing machine |
| 1 | 30" x 6' C. C. engine lathe |
| 1 | 48" x 48" x 10' planes with two railheads and plain motor drive including motor |
| 2 | 16" shapers |
| 1 | No. 2 Universal milling machine |
| 1 | No. 1 Universal milling machine |
| 1 | No. 3 Universal milling machine |
| 1 | 3' Universal Radial drill |
| 3 | 21" stationary head upright drills |
| 1 | Bending roll 6" rolls 10" face |
| 1 | Double wheel grinding stand |
| 1 | Punch |
| 1 | Shear |
| 1 | Semetur drill |
| 1 | 6" slotter |
| 3 | 14" x 30" center engine lathes in straps |
| 5 | Bead vices |

Equipment is all old and inferior in quality and all with exception of planers are belt driven. Also has crude one-half ton cupola in bad condition. Pay of skilled mechanics is $20.00 Chinese dollars per day including board and lodging.

**Removals:** No removals at this plant. Needs electric power and belts to operate, no reduction in capacity due to removals.

PREPARED BY

A. B. Einig

## MANCHU IRON COMPANY
## (Electrical Repair Shop)

**Location:** Anshan - north end of Manchu Iron Company near East Gate.

**Date Visited:** 13 June 1946

**Product:** Repair of electrical equipment for Manchu Iron Company.

**Number of Employees:** 400

**Number of Motors Repaired Per Month:** 240 of an average of 50 HP each.

**Machine Tools in Place Before Removals:** 47 consisting of 12 lathes, 8 boring and drilling machines, 7 shapers, 2 milling machines and 18 miscellaneous pieces consisting of winding machines, etc.

**Removals:** Removed by Soviets: 5 machine tools consisting of 3 lathes, one boring machine and one shaper. Removed by Chinese Communists: 9 lathes, 7 boring machines, 6 shapers, 2 milling machines and 14 miscellaneous machines.

**Equipment Remaining:**

| | |
|---|---|
| 2 | 7½-ton capacity traveling cranes |
| 1 | Over 500 kg flat die forging hammer |
| 1 | Inclinable press |
| 1 | Double end punch and shear |
| 2 | Upright drilling machines |
| 1 | 30" x 10' center engine lathe |
| 1 | 50" swing 8' center lathe |

The motor generator set, transformers and switchboard for test floor were all in place.

**Remarks:** Guide for inspection—a Japanese official.

List of removals furnished by Northeast Chinese Economic Commission.

Capacity reduced by removals 90 per cent.

PREPARED BY

A. B. Einig

Appendix 7 Plant Inspection Report 8-J-1

## MANZAN ENGINEERING WORKS
(Manchu Mining Machinery Mfg. Company)

| | |
|---|---|
| Location: | Changchun |
| Date Visited: | 25 June 1946, by Norman Cleaveland |
| Source and Reliability of Information: | Information from former Japanese plant personnel and from NE Chinese Economic Commission. Both sources considered fairly reliable and their information accepted as true. Present condition of plant was verified by inspection. |
| Date Put in Operation: | Company established 1939 - Plant built 1941. |
| Description of Product: | Flotation machines, ball mills, crushers, hoists, pumps, hand cars, blowers conveyors, bucket elevators. |
| Production: | 150 tons per month |
| Equipment: | Machine shop, forge, foundry |
| Number of Employees: | 210 |
| Removals: | All of machine shop and most of foundry.<br>350 tons of pig iron<br>120 " " special steel and main tools<br>508 " " plates and shapes<br>Remainder taken by looters. |
| Equipment for Restoration: | Complete machine shop and considerable foundry equipment. |
| Stockpiles: | 200 tons of scrap steel. |
| Distribution: | Mining companies in Manchuria. |
| Remarks: | Most of tools in this plant were reported as being second-hand. The entire plant is unimpressive and of doubtful rehabilitation value. |

PREPARED BY
Norman Cleaveland

## MANSHU KIKI K.K.

| | |
|---|---|
| **Location:** | Harbin, Liaoning Province |
| **Date Visited:** | 2 July 1946, by Messrs. Cleaveland and Thorne |
| **Product:** | Apparently, mining and road building machinery |
| **Equipment:** | (a) Steel foundry--possibly for alloy steel<br>(b) 5-ton electric furnace<br>(c) Machine shop about 30,000 square feet in area |
| **Removals:** | Entire machine shop, including overhead crane. Only small parts removed from foundry, apparently by looters. All buildings thoroughly looted. |
| **Equipment for Restoration:** | Complete machine shop; substantial repairs to foundry--particularly electrical equipment. |
| **Stockpiles:** | 300 tons scrap metal |
| **Remarks:** | This plant was inspected with a Communist officer acting as guide and interpreter. He knew nothing whatever of the plant. No information from Japanese sources has been found. However, manganese steel gold dredge buckets were stacked along the railroad siding. These were probably being brought in as scrap metal. In the yard there was considerable partially dismantled roadbuilding machinery, such as rollers, tractors, portable crushers, trommels, concrete mixers, etc. |

PREPARED BY

Norman Cleaveland

Appendix 8 Plant Inspection Report 1-B-1

## MUKDEN REFINERY (COPPER, LEAD AND ZINC)

Location: City of Mukden, Industrial District.

Date Visited: 17 June 1946, by T. L. Johnston and Mr. Shao of the Northeast Chinese Economic Commission.

Date Put in Operation: Smelting, 1935; Refining 1936. Stopped in August 1945; idle since then except for operation of refinery of sludge for gold and silver by Soviets from August 1945 to February 1946.

Products: Refined copper, lead, zinc, gold and silver and copper sulphate.

Best Previous Production and Year (or Capacity):

| | | |
|---|---|---|
| 1944 - | 1,700 tons of | refined copper |
| | 5,000 " | lead |
| | 600 kg | gold |
| | 10,800 kg | silver |
| | 180 tons | zinc |

Equipment: Equipment consists of H&H pot type Roasters for roasting sulfide ores, blast furnaces for smelting both lead and copper ores; copper, lead and zinc refineries for making respective pure metals, and a gold and silver refinery.

Number of Employees at Full Production: 2,000 including 240 Japanese and 100 Koreans - June 1946 - 160 Chinese.

Removals: The following equipment and products were reported to have been removed by the Soviets:

Equipment - 2 vacuum pumps from zinc plant
20 small motors 5-10 HP

| | | | | |
|---|---|---|---|---|
| Products | - Refined | Copper Ingots - | 250 tons valued at | US $ 58,000. |
| | " | Lead " | 500 | 50,000. |
| | " | Zinc | 10 | 2,000. |
| | " | Silver | 15 | 350,000. |
| | " | Gold | 250 kilos | 250,000. |

Destruction: Soviets destroyed office furniture, value estimated at $2,500. Soviets here from August 21, 1945 to February 1946.

Equipment Needed for Restoration: Two vacuum pumps and 20 small motors as listed above for zinc plant.

Source of Raw Materials:

(a) Previous--See map in Source File 1-B-1 for ores. Coke from Anshan and Fouhsin, limestone from Penchihu.

(b) Future--Same.

Stockpiles:

(a) Raw Materials - Copper ore - 10,000 tons low grade (2%)
Limestone - 800
Fluorspar - 400 (for making HF acid)

(b) Finished products - none (Taken by Soviets August '45)

Former Distribution of Product: Gold and silver to Central Bank of Manchuria, Mukden; copper, lead and zinc to Economic Ministry of Manchuria, who sent copper to local sheet and wire fabricating plants; most of lead to Japan, part used locally for various domestic purposes. Zinc was used locally for domestic purposes.

Immediate Future Demands for Products: All can be used in fabricating domestic products locally when fabricating plants are restored.

Names of Present Plant Manager: Che Kia Fou, living in Mukden.

Names of Soviet Officials Handling Removals: Maj. Petroff (Army Organization unknown).

Notes on Process: The plant is a custom smelter and refinery for treating copper and lead ores and concentrates, and producing refined copper, lead, zinc, copper sulphate, gold and silver. The process for copper ores consists of roasting the sulfide ore in batches in H&H pots, smelting the roasted ore in a 15' x 5' blast furnace of 120 tons per day capacity, converting the copper matte to copper anodes in Mabuki furnaces and refining the anodes electrolytically.

For lead the process is similar in that the ores are roasted in pots and smelted in blast furnaces of which there are two; one 10' x 6' with 120 daily capacity, and the other 4' diameter with 40 tons daily capacity. Pig lead from the blast furnace is cast into anodes and then refined electrolytically. The lead refinery has a capacity of 500 tons per month; the copper refinery 240 tons per month but production of copper was stated to be only 150 tons.

Roasted zinc concentrates containing 30 percent zinc were obtained from Hulutao and treated by sulfuric acid leaching in a modified Tainton process in which zinc was dissolved from the ore by sulfuric acid, the solution purified and finally fed to electrolytic cells where pure zinc was recovered. Operation of the zinc plant was reported as being unsatisfactory as only 15 tons per month were produced.

Sludges containing gold and silver from both the lead and copper refineries were treated in a separate refinery where they were first melted in a small reverberating furnace, then cupeled to gold and silver dore metal which in turn was cast into anodes and treated electrolytically to separate the gold from the silver. The final products were cast into marketable ingots.

While the Soviets removed all of the metals on hand they did not clean all the sludge from the lead refinery. The Chinese now occupying the plant are recovering these sludges, refining them and producing gold and silver ingots. This operation has just started.

Remarks: Considering the date this smelter was built (1935) it is surprising that such antiquated methods were installed. However, the fact that this smelter is the only smelter in Manchuria (the one at Antung is reported to be incomplete) it probably smelted all ores available and had no one large source to rely upon, therefore the methods used and the capacities were considered adequate. The metallurgical principals used are universal but some of the equipment is 40 years behind times, laborious and expensive.

In order to resume operations this smelter needs power, and coke. Some clean up work and a few adjustments are all that are necessary to start producing copper and/or lead. Gold and silver production will follow.

Any expansion of this smelter would first depend on availability of more ores. If expansion is planned it would be better to turn this plant into a refinery and do the smelting elsewhere in spite of the fact that a 400 foot stack for dispersing fumes is located here.

Smelting involves the disposal of waste as slag from the blast furnaces. This smelter granulates the slag from both the copper and lead blast furnaces. The granulated slag is then disposed of by small wagons and carts requiring several hundred people for the job. This situation is due to the fact that no consideration had been given to slag disposal when the plant was first located on this site. A more suitable site with provisions for a slag dump would simplify smelter operations and reduce costs.

Removals from this plant were in finished materials, the equipment being practically untouched. This checks with Chinese reports on this plant. Flow sheets for this plant are in Source File 1-B-1.

PREPARED BY

T. L. Johnston

# MOLYBDENITE MINE

**Location:** Yangchiachangtsu, (N. W. Liaoning Province)

**Date Visited:** 13 June 1946.

**Former Owner:** The Manchurian Heavy Industry Company.

**Present Owner:** Under the management of the Northeast Chinese Economic Commission.

**Persons Interviewed:**

K. F. Sze - In charge of non-ferrous mining in Manchuria.
S. Y. Tao - Manager of Yangchiachangtsu mine.
C. H. Pei - Asst. Manager of Yangchiachangtsu mine.
Y. L. Fan - General Affairs, Yangchiachangtsu mine.

The Japanese who had formerly been chief mining engineer.
The Japanese who had formerly been in charge of ore-dressing.
Each of the Japanese is currently working in his former capacity.

**Raw Materials** are ore in the ground and 2000 tons of ore in storage bins ready for milling. The tonnage of ore in the ground is large and a mine capable of production at 60 tons per day is ready for operation.

**Power** was either hydroelectric or steam plant from the Synthetic Fuel Company, Ltd., in Chinchow. There is no power at present and 1000 KWA are needed for operation of the 60-ton/day plant.

**Fuel** is coal, but little is needed. The Chinese have opened two mines producing 50 tons per day of anthracite within 1/2 mile of the mill. This coal supply will be adequate for plant operation and domestic use.

**Plant and Equipment:**

**Mines.** There are 8 groups of shaft mines of which only one, the Termee (or Tze) mine is now in condition to operate. This mine has a daily capacity of 60 tons from an inclined shaft.

The mines extend for about 8 km. along a belt of marble and limestone adjacent to a granite intrusion. The belt trends NE and the principal mining under Japanese operation was from the No. 1 and No. 2 Taberin shafts at the southwest end of the belt. Underground workings of these two shafts extend for about 1 kilometer horizonatally. The No. 1 shaft is 150 meters deep with 5 woking levels and has not reached the bottom of the ore deposit.

There is also one open cut at the Taberin mine that is working a vein 40 meters wide that dips 45° to the west.

There is an ore crushing plant at the Taberin mines and 3 aerial trams from the Taberin mines to the flotation (ore-dressing) plant. These trams are 3.6 kilometers long. The tram buckets are of 300 kg. capacity each and the maximum capacities of the three trams are:

No. 1 - 70 t/hr.
2 - 25 t/hr.
3 - 20 t/hr.

Equipment at the Taberin group of mines:

3 compressors 400 h.p. (capacity 74 $m^3$/min. at 7 atm. each)
2 compressors 200 h.p. (capacity 30 $m^3$/min. at 7 atm. each)
1 shaft with 2 counterbalanced cages of 1 ton car capacity each.
1 shaft with 2 counterbalanced skips of 1.8 ton capacity each.
1 shaft 75% completed.
2 gyratory crushers (capacity 800 t/day)
1 - 4 foot cone crusher
1 - 3 foot cone crusher
1 - 20 mm. vibrating screen
1 - 12 mm. vibrating screen
1 - 54" x 20" crushing roll
1 set of concrete ore bins with 800 ton capacity
200 mine cars

Equipment is in good condition except that all conveyor belts have been removed; all ball bearings from mine cars have been removed; all electric motors and instrument panels have been completely wrecked.

Equipment Needed: Bearings for mine cars (SKF 6310 and 6210); electric motors; motor belting, V-type; conveyor belting; control instruments; and dynamite.

Equipment at the Termee (Tze) mine:

2 - 100 h.p. motors for compressors (14.5 $m^3$ min. at 7 atm.)
1 drum hoist for the inclined shaft

By cannibalism of equipment and replacement of motors and motor belting from limited undamaged stocks this mine has been put in condition for operation at 60 tons per day.

Equipment Needed: One ton of dynamite per month.

Flotation Plant: The flotation plant had a capacity of 800 tons per day. There is crushing equipment in the plant that was formerly used for lead-zinc ore (prior to December, 1943). The total equipment is as follows:

3 storage bins (1,500 tons; 600 tons; and 500 tons capacity)
1 gyratory crusher (60 t/hr)
1 cone crusher (60 t/hr)
1 ball mill, conical 8' x 36"
3 ball mill, conical 10' x 66" (600 t/day each with 1/2" feed)
3 hoe type classifiers
3 screw elevators
4 series of rougher flotation units of 24 cells each. These use pine oil, potassium xanthate, water glass, NaCN, and kerosene as reagents.
4 pumps
1 series of cleaner flotation unit of 12 cells, using same reagents.
1 drying pan
2 filter presses
3 settling tanks
4 Oliver (drum type, air) filters
3 Lowden dryers

All electric motors were removed or destroyed, all conveyor belts were removed; all motor belts were removed; other equipment was not damaged.

The crushing plant which was used prior to December 1943, for lead-zinc ore has been put in operable condition to crush 60 tons per day of molybdenite ore. Two series of 24 cells each of the flotation unit, and the one 24-cell cleaner unit have been put in operable condition with motors and motor belting from stocks that were not damaged.

Conveyor belts have been replaced by aerial trams and cable car inclines.

There is an adequate supply of reagents for several years of operation (estimated by Mr. Sze at 10 years at 60 tons per day operation).

Laboratory: The laboratory was completely stripped by local Chinese residents, according to statements of the mine officials, both Chinese and Japanese.

Transformer Station: There is a 66 kv. transformer station that transformed to 3300 v. with 3 sets of 2000 kva transformers. This station is undamaged.

Machine Shop: There is a small machine shop from which about half of the machines in best condition were reported to have been removed by Chinese Communists and local residents.

Foundry: A small foundry was not damaged and is in operation.

Hospital: A small hospital was stripped of all equipment; X-ray machines; surgical instruments; and medical supplies. It was reported by Mr. Sze that this was done by the Soviets. One Japanese doctor and one Chinese doctor are still at the mine.

Water Supply: Water is supplied from a well 3 km. south of the ore-dressing plant that is equipped with three 70 h.p. motors, all of which are in good condition.

Clubhouse and Offices: In good condition but most of the records have been destroyed, partly by the Japanese and partly by local residents according to statements of Mr. Sze.

Production: Exact data on past production were not available due to the destruction of records. However, the open cut has a capacity of 200 t/day; No. 1 and 2 Taberin shafts a capacity of 700 t/day, all of 0.4 percent molybdenite content; and the Termee shaft a capacity of 60 t/day containing 1.0 percent molybdenite.

Production from the start of molybdenite mining in December, 1943, until August 15, 1945, was estimated at about 400,000 tons containing an average of 0.4 percent molybdenite.

Labor: During the war 6000 Chinese laborers and 300 Japanese (staff and some workmen) were employed in the mines and flotation (ore-dressing) plant.

At present about 500 people are employed opening the two coal mines, remodelling the flotation plant and crushing equipment for operation at 60 tons per day, preparing the Termee mine for 60 tons per day operation, and cleaning up.

The decline in labor is due to the fact that the mine cannot be put in operation at more than 10 percent of its former capacity until additional equipment is available; the workmen's houses have been stripped of all wood for fuel and workmen have moved out of the area.

The present labor is all male Chinese with the exception of the Japanese chief mining engineer and the Japanese head of the flotation ore-dressing plant.

Economics of Distribution: The product was concentrated to 65-70 percent molybdenite and shipped to Japan. Pressure was continually exerted to maintain production at the maximum level. There are at present 120 tons of 64-70 percent molybdenite on hand in warehouses.

Transport facilities: The plant is at the terminus of a privately owned railway, 35 km long, with the following rolling stock; 2 good locomotives; 1 locomotive in need of repairs; one locomotive in the process of repair at the mine foundry and shop; 18 self-dumping ore cars of 30 ton capacity; 1 box car; one caboose.

This railroad also hauls limestone from a quarry at Yangchiachangtzu with a 500-600 ton per day capacity; an iron mine, Lakiatze mine, 30 km beyond Yangchiachangtzu from which ore is hauled to the railroad by motor truck; a small manganese mine, Kongchaden mine, halfway between Yangchiachangtzu and Chinhsi (the mainline terminus); and farm produce.

There is direct rail connection to the port of Hulutao, a total of 45 km from the mine.

General Remarks: This mine started operation in 1935 as a lead-zinc mine with a mill of 50 tons per day capacity. In 1939, the mill was expanded to 500 tons per day. Molybdenite was discovered in 1939, and exploratory work indicated a large ore reserve. From January, 1940 to June 1942, the mill operated at 100 tons per day of molybdenite ore, and was increased to 500 tons per day. By January 1, 1944, all mining of lead-zinc was stopped and the molybdenite plant was operated at 800 tons per day.

This deposit is certainly one of the largest known molybdenite deposits in the world. The Japanese mining engineer has estimated a proved reserve of 4,000,000 tons averaging 0.4 percent molybdenite, and a reasonably assured reserve of an additional 4,000,000, with the full extent of the ore deposits relatively unexplored. From field observation of the ore deposits, the crude ore, the extent of mine workings, and the general geologic setting of the ore deposits, these statements appear completely sound, and the potentialities of the deposit are extremely great.

The Soviet army was at the mine for about 2 weeks in September. According to statements of the staff they removed only motor cars and hospital equipment. The Chinese communists were reported to have occupied the area for about one month, from late September to late October, and were reported to have removed some machine tools, conveyor and motor belting, and to have destroyed all installed electric motors. The local people are reported to have stripped the laboratory; to have removed all ball bearings, some machine tools, and some belting; and to have removed all wood from workmen's houses for fuel.

The ingenuity and energy demonstrated by the staff in converting the plant to 60 tons per day operable capacity, in opening coal mines for local needs; and in cleaning up and maintaining equipment were very impressive.

The friendly attitude and mutual respect between the Chinese and Japanese members of the staff was striking.

PREPARED BY

T. A. Hendricks

## MANCHURIAN LIGHT METAL COMPANY - FUSHUN

**Location:** Fushun, next to the Fushun Iron Works at the west end of the Fushun industrial section.

**Date Visited:** 4 June 1946

Limestone from nearby deposits and aluminous shale from the vicinity of Penchihu were roasted in shaft kilns. The resulting CaO and roasted ore, together with Rolling Mill Scale and powdered coke from Anshan were charged into electric furnaces, producing Ca-Aluminate, with ferro-silicon as a byproduct. The Ca-Aluminate was processed through a crushing mill, extraction tank, Dorr thickener, refining tank, Dorr Thickener, precipitation tanks, Oliver filter and rotary kiln to form alumina ($Al_2O_3$). This in turn was charged into electrolytic furnaces and re-melting furnaces to produce metallic aluminum.

An electric shop was operated in conjunction with the alumina and aluminum plants. There were also facilities for rolling and casting aluminum. Electrodes from this plant were used entirely for furnaces within the plant.

Figures given to us by Mr. C. Y. Cheng indicate that prior to August 15, 1945, this plant was producing 1,361 metric tons of aluminum and 12.54 tons of ferro-silicon per month. There were no production of these items after August 15, although his report indicates an output of 173 tons of carbide monthly after August 15th.

This plant was built in 1936. It had a rated capacity of 10,000 metric tons of aluminum per year. Actual production in a year's time was said to be about 8,500 tons. This would indicate that the output of 1,361 tons per month reported by Mr. Cheng just prior to August 15, was higher than had been achieved prior to that time.

From questioning of the manager of the plant, we learned that production of aluminum from aluminous shale at this plant was not economical and could not be justified except under the necessity of war.

The removal of equipment leaves the plant so deficient of key equipment as to make it practically useless from an operating standpoint. Bus bars in all remaining furnaces have been removed. The rotary kilns, elecgrolysis units, some electric arc furnaces and much of the essential electrical auxiliaries such as rectifiers and substation equipment have been removed. Removal was said to have been made by the Soviets in October and early November 1945.

PREPARED BY

E. L. Shaner

## CHINCHOW SMELTER

**Location:** Nuerhho, 15 km. south of Chinchow.

**Date Visited:** 13 June 1946.

**Management:** Manchuria Heavy Industry Development Company through the Manchuria Mining Company.

At present the plant is not operating, but is under the jurisdiction of the Northeast Chinese Economic Commission.

The former Japanese manager is acting as caretaker and will undertake any work of rehabilitation.

Persons interviewed were the Japanese Manager and Mr. Sze, in charge of non-ferrous mining for Manchuria for the Northeast Chinese Economic Commission.

**Raw Materials:** Raw materials are iron containing titanium and vanadium from the Luanping Mine, in Luanping prefecture, Jehol province. The assured ore reserve is estimated by the Japanese as 10,000,000 and there is possibly an additional 30,000,000 tons. The ore is a segregation from gabbro and is essentially identical with vanadiferous iron ore of the Adirondack Mountains in New York.

The ore is concentrated at the mine by magnetic separation by the Crockett and the Grondall methods.

Production of iron ore and concentrates at the Luanping Mine has been as follows:

## IRON ORE

### Run of Mine Ore

| Year | Month | Metric Tons | Fe | $TiO_2$ | V |
|---|---|---|---|---|---|
| 1943 | 4-12 | 71,416 | 46.5 | 11.4 | 0.22 |
| 1944 | 1-12 | 89,856 | 45.0 | 9.7 | 0.22 |
| 1945 | 1-7 | 36,087 | 42.3 | 9.0 | 0.22 |
| TOTAL | | 197,359 | 45.1 | 10.2 | 0.22 |

### IRON CONCENTRATE

| Year | Month | Metric Tons | Fe | $TiO_2$ | V |
|---|---|---|---|---|---|
| 1943 | 4-12 | 27,355 | 63.5 | 8.3 | 0.42 |
| 1944 | 1-12 | 35,577 | 61.4 | 7.5 | 0.42 |
| 1945 | 1-7 | 12,997 | 61.2 | 7.3 | 0.42 |
| TOTAL | | 75,929 | 62.1 | 7.8 | 0.42 |

### TITANIUM CONCENTRATE

| Year | Month | Metric Tons | Fe | $TiO_2$ | V |
|---|---|---|---|---|---|
| 1943 | 4-12 | 1,879 | 37.8 | 38.0 | |
| 1944 | 1-12 | 1,744 | 39.4 | 33.5 | |
| 1945 | 1-7 | 800 | 36.0 | 33.0 | |
| TOTAL | | 4,423 | 38.1 | 35.3 | |

**Power:** Power was supplied by the Manchuria Electrical Company from power lines of 66,000 V. and 22,000 V. There were two transformer stations reducing the voltage to 3,300 (one 1500 KVA and one 3,000 KVA). A third station of 8,000 KVA was in the process of installation.

**Fuel:** Fuel used is producer gas generated at the plant in 3 gas producers, 35 ton/day capacity each. The coal used was 20-30 percent Fouhsin and 70-80 percent Fushun.

**Plant and Process:** The iron concentrate containing vanadium was roasted in rotary kilns with $Na_2SO_4$ ($Na_2CO_3$ not available) as 10 percent of the charge, at 900°--1100° C. for 3 hours. The $Na_2V_2O_5$ formed was extracted with water to a concentration of about 2 grams V/liter. Ferrous Sulfate ($FeSO_4 \cdot 7H_2O$) was added and the mixture passed a settling tank where $FeV_2O_5$ settled out. The cake passed to filter presses, dried, and 45-50 percent granular aluminum was added to the $FeV_2O_5$.

At this point an electric furnace was formerly used to convert to ferrouanadium but in the later operation of the plant the mixture of Fe $V_2O_5$ and granular aluminum was charged to kettles and fired by electric arc. Burning of the aluminum produces a temperature of 3,000-4,000° C. and forms the ferro-vanadium. This is a process developed by the Japan High Frequency Heavy Industry Company and is based on Juule's law. The ferro-vanadium contains about 35 percent V.

After extraction of $Na_2V_2O_5$ (above) the remaining powdered iron ore went to the electric furnaces and was converted to raw steel. Ferro alloys were then added as required and special steels made in the electric furnaces.

**Equipment:**

| MACHINE | | MOTOR H.P. |
|---|---|---|
| 1 Ore bin | 250 $M^3$ | |
| 1 Belt conveyor | 750 mm. x 38.0m. | 15 |
| 1 " " | 508 mm. x 32.5m. | 10 |
| 1 " " | 750 mm. x 35.5m. | 15 |
| 1 " " | 610 mm. x 29.0m. | 15 |
| 1 " " | 610 mm. x 75.0m. | 30 |
| 1 " " | 610 mm. x 26.0m. | 20 |
| 1 Bucket elevator | 508 mm. x 17.0m. | 20 |
| 1 " " | 508 mm. x 14.0m. | 20 |
| 1 " " | 508 mm. x 13.0m. | 20 |
| 3 Table feeders | 1.5m | 3 at 15 |
| 3 Rotary kilns | 2.3m. x 38.0m. | 3 at 75 |
| 1 Bucket elevator | 480 mm. x 15.0m. | 30 |
| 1 Exhaust fan | 570 mm. | 20 |
| 1 " " | 2300 mm. | 100 |
| 1 Roasted ore bin | 157 $m^3$ | — |
| 3 Gas producers | 35 tons/day | 3 at 10 |
| 3 Turbo blowers | 5 atm. | — |
| 3 Hankashiger boilers | 2130 mm. x 9140 mm. | — |
| 6 Gas fans | 970 mm. | 6 at 20 |
| 1 Air fan | 970 | 20 |
| 1 Belt conveyor | 24" x 25.0 m. | 10 |
| 1 " " | 24" x 5.0 m. | 2 |
| 1 Tube mill | 6' x 12' | 150 |
| 1 Conical mill | 8' x3' | 150 |
| 8 Sand Pumps | 4" | 8 at 25 |
| 1 Don thickener | 9.15m x 2.6 m. | 5 |
| 1 " " | 9.15m x 2.5 m | 5 |
| 1 " " | 9.15m x 1.9 m. | 5 |
| 3 " " | 9.15m x 2.0 m. | 3 at 5 |

| MACHINE | | MOTOR H.P. |
|---|---|---|
| 3 Dorr filters | 3.6m x 1.8 m | 3 at 10 |
| 2 Plunger pumps | 5" x 6" | 2 at 3 |
| 1 Diaphragm pump | 6" x 6" | 5 |
| 5 Vacuum pumps | | 5 at 40 |
| 4 Air compressors | | 4 at 25 |
| 2 Air compressors | | 2 at 15 |
| 1 Belt conveyor | 18" x 30m. | 10 |
| 1 " " | 18" x 45m. | 10 |
| 1 " " | 18" x113m. | 25 |
| 2 Reaction tanks | 5.0m x 3.0m | — |
| 3 " " | 4.5m x 3.0m | — |
| 2 " " | 4.0m x 3.7m | — |
| 6 Filter presses | 800 mm x 40 mm | — |
| 4 Turbine pumps | 4" x 3" | 4 at 20 |
| 1 Air compressor | 7 atm. | 75 |
| 1 Reverberatory furnace | 2m x 5m x 1.5m | — |
| 1 " " | 1.5m x 3m. x 1.5m | — |
| 15 Reduction pots | 0.8m x 1.0m x 1.0m | — |
| 1 Travelling crane | 3 ton x 10.2 m | 7.5, 5.0, 2.0 |
| 1 Cupola | | |
| 8 lathes | | |
| 3 drills | | |
| 1 slotter | | |
| 1 shaper | | |
| 1 planer | | |
| 1 milling machine | | |
| 1 tool grinder | | |
| 1 Y$_4$ hammer | | |
| 1 bending roller | | |
| 1 fan | | |

Evidences of Removals: No belts, motors, electrical recording instruments, or machine tools were seen. It was stated that these had been removed by the Soviet forces.

In addition the office buildings and the two modern workmen's villages had been burned. It was stated that this was done by the Soviets on September 19, 1945, and many of the light installations such as filter presses had been wantonly smashed. Heavy equipment was undamaged. The replacements needed are the same as the equipment removed.

Production:

| Year | Month | Roasted M. Tons | Ore Grade V | Ferro-vanadium M. Tons | Products V-Grade |
|---|---|---|---|---|---|
| 1943 | 4-12 | 19,329 | 0.42 | 33,501 | 30.6 |
| 1944 | 1-12 | 33,008 | 0.42 | 79,870 | 37.5 |
| 1945 | 1-7 | 15,178 | 0.42 | 32,522 | 36.0 |
| | | 67,515 | 0.42 | 145,893 | 35.0 |

These figures appear to be somewhat inconsistent as tonnages and grades of raw materials and finished products indicate a low vanadium recovery. It was stated that the capacity of the plant was 15 tons of ferro-vanadium monthly which could be raised to 30 tons monthly if sodium carbonate were available. The raw steel capacity was stated to be 10,000 tons per year but actual operation attained only 5,000 tons per year.

Disposition of Products:

The titanium concentrates were shipped to Japan to the "Ube Titan Industry Company," for the manufacture of titanium white and other electrical appliance materials. The ferro-vanadium and alloy steels went into industry as needed in Manchuria and elsewhere in the former Japanese Empire.

Stocks on Hand are as Follows:

10,000 tons of iron ore with the vanadium extracted.
3,000 tons of raw ore containing vanadium.
3 tons of ferro-vanadium.

Labor: Figures on labor were not obtained. It is estimated that about 1,000 persons were employed in the plant. These were largely adult male Chinese, with a staff of not more than 100 Japanese technical, office, and master workmen.

Transport Facilities: The plant is located on a branch railroad line that leads to Chinchow.

General Remarks: This process is interesting because of the process of utilizing granular aluminum for heat to form the ferro-vanadium. Detrimental factors are the cost of grinding the crude ore (detailed figures not available) and the high power consumption in the pot roasting which was stated to be 4,500 KWH/ton. The advantages are no moving parts or blast furnace and the speed of operation.

The equipment on hand as listed was checked in so far as possible and the list is believed to be correct.

The following persons were interviewed in Chinchow June 8 - 10, 1946, by H. M. Thorne, T. A. Hendricks, E. Martin and Captain Scott:

| | |
|---|---|
| Hoo, An-Kai | Director of National Economic Administration, Mukden Office |
| Tsao, Li-Chin | Director, Paper Mill, Chinchow |
| Chin, Ping-Chang | Director, Synthetic Fuel Co., Ltd., Chinchow |
| Tu, Li-Fun | Director, Wool Mill, Chinchow |
| Chang, Kung-Liang | Director, Cotton Mill, Chinchow |
| Sze, Chia-Fu | In charge of non-ferrous metals work for Manchuria |
| Sun, Yueh-Chi | Director, Chinhsi Fuel Plant |
| Wu,Kuo-Yin | Assistant to Hoo |
| Ho, Shi-Li | Harbor Commander, Hulutao |
| Han, Teh-Shun | Mayor of Chinchow |
| Liu, Kwang-Tsun | Magistrate of Chinhsi |
| Liay, Pao-Hwa | Director, Peipiao Coal Mines |
| Kuo, Hsiang-Yu | Director, Fouhsin Coal Mines |

PREPARED BY

Thomas A. Hendricks

## MANCHU RESEARCH INSTITUTE FOR COAL HYDROGENATION

Location: Mukden, Liaoning Province, Manchuria

Date Visited: 1 June 1946 by Messrs. Thorne, Cleaveland and Lt. Col. Schenck.

Source and Reliability of Information: Information regarding the plant was obtained from the report on Manchurian Industries prepared by the Northeast Chinese Economic Commission, Mukden (Source File 202-E-1). The information is considered fairly reliable and the extent of removals and damage was confirmed by inspection. The explanation of the source of removals is accepted as true.

Date Put in Operation: 1945

Description of Product: Aviation gasoline - 2,000 metric tons per year (largest producer of aviation gasoline in Manchuria).

Best Previous Production and Year: Capacity as of August 15, 1945 - 2,000 metric tons of aviation gasoline.

Plant Equipment: August 15, 1945. The equipment was completely removed from this plant; consequently, it is impossible from inspection to list the equipment formerly present. It consisted of equipment for making and purifying hydrogen, catalytic reactors, for hydrogenating middle oil from coal tars, distillation and treating equipment. The Northeast Chinese Economic Commission estimates that 51 machines and parts with a value of $199,010 were removed. (See Source File 202-E-1 for a detailed list of removals.)

Removals: All equipment was removed and in addition it is reported that all the Japanese technicians also were taken by the Soviets.

Restoration of Damaged and Removed Equipment: Inasmuch as the installation was of German design and the equipment manufactured in Germany, it would be difficult if not impossible to replace. Moreover, the economic feasibility of the process seems doubtful. It is not recommended that the plant be replaced--it was constructed primarily for the manufacture of a war product.

Source of Raw Materials: The "Middle Oils" from the distillation of low-temperature tars from the various LTC plants in Manchuria were sent to this plant for hydrogenation to aviation gasoline.

Former Distribution of Product: The aviation gasoline was all taken by the Japanese Army.

**Present Plant Manager:** The Northeast Chinese Economic Commission has custody of this plant.

**Names of Soviet Officials handling Removals:** The equipment was removed by the Soviet Army but the names of the officials are unknown.

**Process:** The "Middle Oil" from low temperature carbonization of coal was catalytically cracked and hydrogenated to produce aviation gasoline. The process is said to be of German design and all equipment was purchased from Germany.

**Remarks:** The plant is completely stripped of all materials and equipment that would be of industrial use except the brick buildings that housed the plant offices and laboratories. Sides of buildings have been knocked out to allow removal of equipment. Russian writing is in evidence on walls of buildings. Although it appears evident that the tools and equipment were removed by the Soviets, the buildings are so thoroughly clean of even scrap, that it seems probable that Chinese residents or others did the final pilfering of small items and caused destruction to windows, plumbing facilities and electrical wiring accessories.

PREPARED BY

H. M. Thorne

## SOUTH MANCHURIAN RAILWAY COMPANY CHEMICAL FACTORY
## (Synthetic Lube Oil Plant)

Location: Mukden, Liaoning Province, Manchuria

Date Visited: 1 June 1946 by Messrs. Thorne, Cleaveland and Lt. Col. H. G. Schenck.

Source and Reliability of Information: The information was obtained from the former Japanese plant manager who is believed to be fairly reliable. The type and the quantity of the equipment and its present condition were confirmed by the inspection.

Date Placed in Operation: 1941

Products: The products manufactured in the synthetic lubricants portion of this plant are:

Synthetic steam cylinder oil - 500-600 kl/yr.
Refined paraffin wax from shale oil - 4,000 kl/yr. (est.)
Greases and hydrochloric acid (quantity not obtained)

Plant Equipment: August 15, 1945. This plant contained two reactors for chlorination of paraffin wax, washing and neutralizing agitators, filter presses, chillers, fractionating columns, vacuum stills, and several small product storage tanks.

Number of Employees: The entire plant of which the synthetic oil process is only a small part employed 800 to 1,300 people. (See description of this plant in Chapter X.) The number of employees working in the synthetic lubricating oil plant alone was not determined.

Removals: No equipment was removed or damaged in this plant except two reactors which were damaged by a fire of unknown origin since August 15, 1945 (see Source File 202-C-1 for detailed list of supplies removed).

Raw Material: Unrefined shale oil wax from the Fushun Oil-Shale Plant was used for the raw charging stock together with chlorine from the caustic soda plant.

Former Distribution of Product: The synthetic oil was used as steam cylinder lubricant by the South Manchurian Railroad.

Immediate Future Demands for the Product: The plant is in operating condition as soon as electric power becomes available and may be used to produce some much needed lubricants until they become available from other sources. By that time the Northeast Chinese Economic Commission should have made a careful cost analysis of the process to determine its feasibility as a future source of lubricants.

Present Plant Manager: Under the direction of Mr. Tsai, Northeast Chinese Economic Commission.

Soviet Officials Handling Removals: Soviet officials who were in charge of operations at the plant when the equipment was removed were Messrs. Leicenko and Almaghamar.

Process: Crude shale-oil paraffin wax from the Fushun Shale Plant was agitated with chlorine by countercurrent circulation at low pressure and temperature. The mixture was then neutralized with soda ash, chilled, and the wax separated from the oil by centrifuging. Apparently the wax was not further purified but was used in candle making. The chlorinated oil was charged to autoclaves and agitated with a zinc chloride catalyst for 16 hours at 340 degrees centigrade. Hydrochloric acid formed by the treatment was transferred to an adjoining soya bean sauce plant. The oil was first dehydrogenated then polymerized by the process. The polymerized oil was fractionated by vacuum distillation and neutralized with caustic soda. It was used by the railroad as a steam cylinder oil.

Remarks: The former Japanese manager who has been retained by the Chinese stated that the lubricating oil so produced was inferior to petroleum lubricants and that the chlorine treatment of wax gave a product of about equal quality to sulfuric acid treated wax. He said that the process was not economical but was used as no other source of supply was available.

PREPARED BY

H. M. Thorne

## MANCHURIA SYNTHETIC PETROLEUM COMPANY, LTD.

**Location:** Kirin, Kirin Province, Manchuria

**Date Visited:** 2 July 1946 by John P. Hurndall

**Source and Reliability of Information:** Inspection was made together with Dr. C. C. Shao of the Northeast Chinese Economic Commission and a former Japanese plant engineer, who is considered reliable. Information as to removals was accepted as correct and partially confirmed. Information relative to existent equipment was confirmed.

**Date Put in Operation:** Plant never actually placed in operation.

**Description of Product:** Synthetic oil, gasoline, semi-diesel oil and bunker fuel oil; synthetic methanol, crude wax, pitch, crude cresol, coalite.

**Designed Capacity:** Crude methanol 15,000 T/yr; low temperature tar 10,000 T/yr; semi-cokes 130,000 T/yr.

**Plant Equipment as of August 15, 1945:** Lurgi low temperature carbonizer of 150 T/D coal capacity consisting of 4 units, only 2 of which were completed; 3 Winkler water gas generators of 15,000 cubic meter/hr. capacity; 2 - 3,000 cubic meter/hr. and 2 - 2,000 cubic meter/hr. oxygen separators, Thylox gas purifier, co-converter, 2 - 5,000 HP gas compressors, 2 - 2,000 HP gas compressors, 6 - 10,000 kiloliter per year synthetic methanol reaction vessels; Fischer-Tropsch synthetic petroleum equipment of 1,000 KL per year; small tar refinery, electric generating plant consisting of 2 - 9,000 kw steam-turbo generators, and 2 - 40 T/hr. tubular boilers.

**Removals:** The following items, which comprise about 90 per cent of the plant equipment and consists of practically everything except towers, furnaces and buildings, were removed by the Soviets in 1945:

(a) Tubes, pumps and auxiliary movable equipment from 2 - 40 T/hr. boilers
(b) All auxiliary equipment from low temperature furnaces
(c) Two 9,000 kw steam turbine generators
(d) Three 6,000 cubic meter/hr. gas compressors
(e) Five 300 HP gas compressors
(f) All chambers for synthetic gas
(g) Washing plant completely removed
(h) Two 5,000 HP gas compressors

The Japanese plant manager estimates that 95 per cent of the original equipment, valued at 2,030,545.00 US dollars, consisting of 485 pieces and 3,686 tons, were removed by the Soviets.

**Destruction:** No additional destruction reported or observed.

**Comments on Restoration:** In view of the poor success achieved by this and similar plants throughout Manchuria, restoration would not seem advisable. The present Japanese manager does, however, consider that oil-shale distillation to the extent of 6,000 T/yr. could be undertaken.

**Source of Raw Materials:** Coal from Jyako coal mine 40 miles distant; oil-shale from Hoaden.

**Stockpiles:** Raw materials - 3,600 tons of pit coal
Finished products - none

**Names of Soviet Officials Handling Removals:** Lt. Col. Zydapel (Zuparefu) and Major Diement.

**Process:** The plant uses the Lurgi process and was built following experimental work at Fushun.

**Remarks:** Flow sheets and plan of plant lay-out and further detailed information will be found in Source File 9-E-1.

PREPARED BY

J. P. Hurndall

# JAPANESE ARMY FIRST FUEL DEPOT

**Location:** Ssupingchieh, Liaoning Province, Manchuria

**Date Visited:** 16 June 1946 by H. M. Thorne and T. A. Hendricks

**Source and Reliability of Information:** Information regarding the history, production, process and removals was obtained from Mr. Liu, of the Northeast Chinese Economic Commission, Mukden, and Dr. Masume, former Japanese head of laboratory, both of whom accompanied us on the inspection. The source of the information is believed to be fairly reliable and the condition of the plant was confirmed by inspection.

**References:** (a) JANIS - Chapter IX, October 15, 1945, Part II, pages 247-50
(b) "Petroleum Facilities of China, Manchuria and Korea", Report of QMG, July 1945, pages 55 and 57.

**Date Placed in Operation:** 1938

**Description of Products:** Only three products are manufactured at this plant — aviation gasoline, motor gasoline, and 95 per cent alcohol.

**Best Previous Production:** Although the plant had a capacity to produce 180 bbls. per day of gasoline by hydrogenating crude oil residues and a small additional quantity of straight-run gasoline obtained by topping the crude oils, the largest yearly production was made in 1943, amounting to 6,240 bbls. of aviation and motor gasoline.

Plant Equipment: This factory consists of the old plant which operated with a capacity of 180 bbls. per day and the new plant under construction but not completed, which was to have a gasoline capacity of 625 bbls. per day produced by hydrogenating crude residues in addition to gasoline topped from crude oils. Following is a list of the major equipment:

| | OLD PLANT | NEW PLANT | TOTAL |
|---|---|---|---|
| Gas Producers | 4 | 5 (5,000 $m^3$/hr. ea.) | 9 |
| Hydrogen Compressors | 5-450 hp.ea. | 0 | 5 |
| Methane cracking units | 3 | 2 | 5 |
| $CO_2$ Removal, Washing units | 2 | 2 | 4 |
| $H_2S$ " " | 1 | 1 | 2 |
| Oil Hydrogenation Units | 1 | 1 | 2 |
| Steam boilers | 3 | 0 | 3 |
| Badger Pipe Stills and Columns | 1-325 bbl./day | 1 (2,000 bbl./day) | 2 |
| Alcohol Distillation Unit | 1 | 0 | 1 |
| Catalyst Mfg. Plant | 0 | 1 | 1 |
| Gasometers | (several - various sizes) | | |
| Machine shops | 1 (stripped) | 1 (incomplete) | 2 |
| Warehouses | (about 6) | | 6 |
| Welding shop | 1 (stripped) | 0 | 1 |
| Transformers | 2 | ? | 2 |

Number of Employees at Full Operation: 400 staff - all Japanese; 1,100 workers - all Japanese; Chinese coolies for construction.

Removals: Personnel - All Japanese staff members above the grade of 2nd Lt. were removed by the Soviets, according to Mr. Liu (Northeast Chinese Economic Commission). NOTE: Reports obtained by Mr. Cleaveland in Ssupingchieh said Japanese officials substituted Japanese coolie names for staff members and coolies were taken instead of officers.

Equipment - Japanese personnel first were taken, then equipment was removed and shipped by rail to the northwest. The Soviets arrived 15 September 1945 at the factory and left 10 November 1945.

Machine tools, motors, laboratory equipment, oil, and part of the control instruments were removed by the Soviets, and later all small electric motors were removed, mostly from the warehouses. Two 8,000 KVA transformers were removed.

Destruction: There was considerable evidence of destruction in laboratories and warehouses and considerable pillaging of small equipment, belting, etc., but the major equipment in the plant with the exception of motors and control instruments is intact.

Comments on Restoration: The new plant, with a crude oil distillation capacity of 2,000 bbls. per day could be restored without too great an expense by utilizing some equipment from the old plant and acquiring electric motors and control instruments and re-tooling of machine and welding shops. The restoration of the hydrogenation operations would require little additional equipment but the extremely high cost of such operations make its restoration inadvisable. The equipment might be used for synthesis of ammonia.

Source of Raw Materials:

(a) Past: Coal from Hsian, coke from Penchihu, coalite from Chinhsi, petroleum from Borneo, and petroleum residues from Genzan, Korea and from refineries in Japan.

(b) Future: Petroleum from East Indies would seem the best source of raw material.

Stockpiles: Raw materials - crude oil (Borneo) 100 tons

Former Distribution of Products: All products were used by the Japanese Army.

Immediate Future Demands for Products: Manchuria is greatly in need of lubricants and motor fuels.

Name of Present Plant Manager: Mr. Wang, of Chinese Provincial Government.

Name of Soviet Official Handling Plant Removals: Major Davidov - (see attached remarks by Mr. Cleaveland).

Process: This plant was the first Japanese Army Fuel Plant in Manchuria. The main function of the plant was to hydrogenate residual oils to aviation and motor gasolines. The crude residues were obtained from a topping unit in the plant and from those shipped in from Korea and Japan. Hydrogen was obtained from the purification of producer gas by the removal of carbon dioxide from the gas after carbon monoxide had been oxidized to carbon dioxide and by the cracking and purification of methane from plant gases.

Hydrogen and carbon monoxide gases from the producers were desulfurized and passed through a carbon monoxide converter using iron oxide as the catalyst, where the carbon monoxide was oxidized to carbon dioxide. The carbon dioxide was removed from the mixture by scrubbing with alkaline water. Methane was cracked to carbon dioxide and hydrogen at 600 degrees C. at substantially atmospheric pressure in the presence of steam and nickel sulfide-on-asbestos catalyst. The carbon dioxide was removed by the use of high-pressure alkaline water washers.

The purified hydrogen and petroleum residues were reacted at 200 atmospheres pressure and 400-450 degrees C. in a reaction chamber in the presence of a molybdenum sulfide and catalyst on acid clay (50 parts MoS to 50 parts clay). Only material boiling in the gasoline range (40 per cent aviation gasoline, 40 per cent motor gasoline) was recovered, the residual oils (20 per cent) being recycled.

A pipe still and Badger column and stabilizers were used for topping crude oils and fractionating the reaction products.

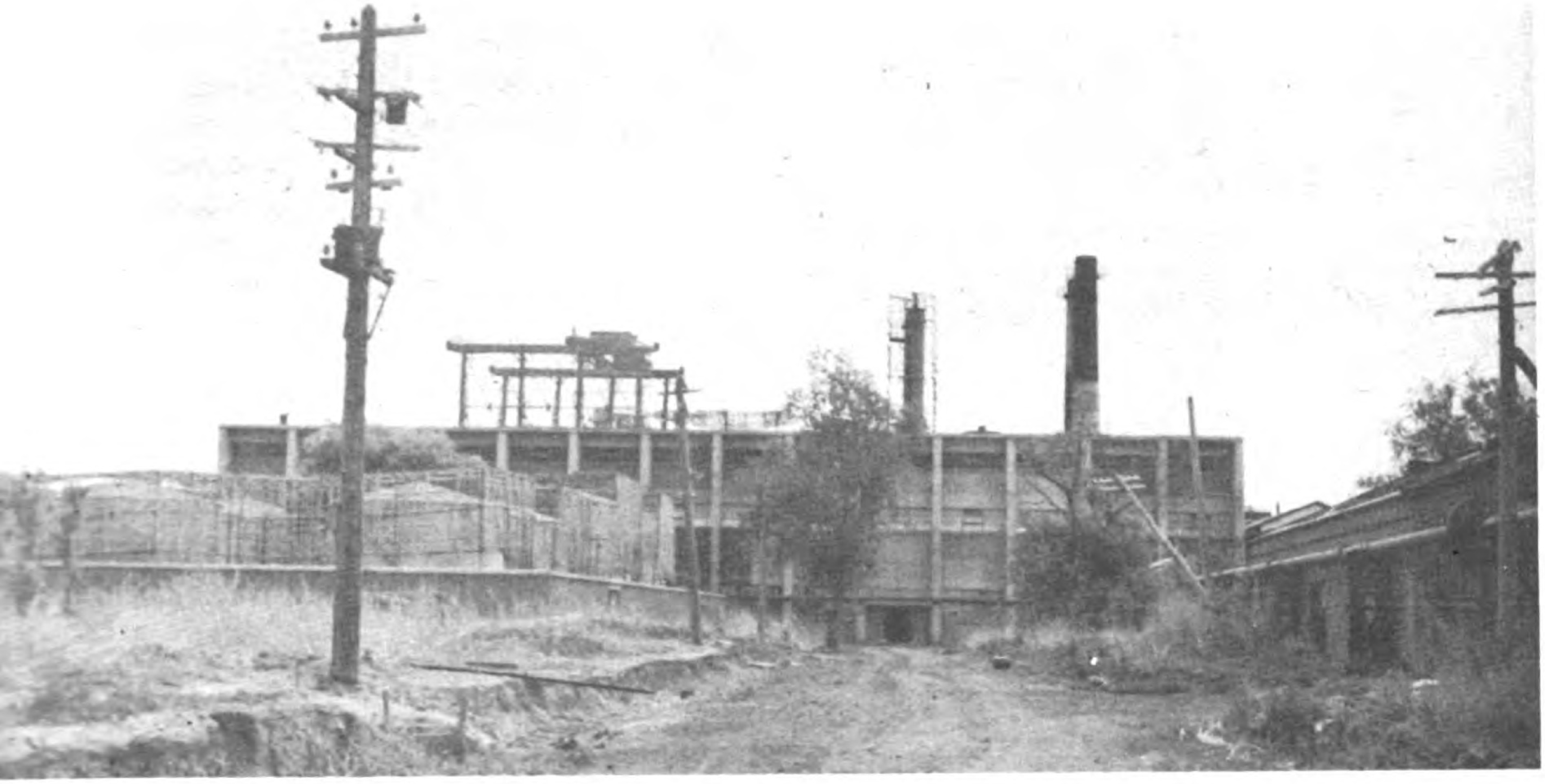
The new plant is said to have been considerably improved in design and operating technique. It was to have a capacity of 5 to 6 times that of the old plant.

The alcohol plant is separate from the remainder of the plant. Ninety-five per cent alcohol is manufactured by distillation and rectification of native wines.

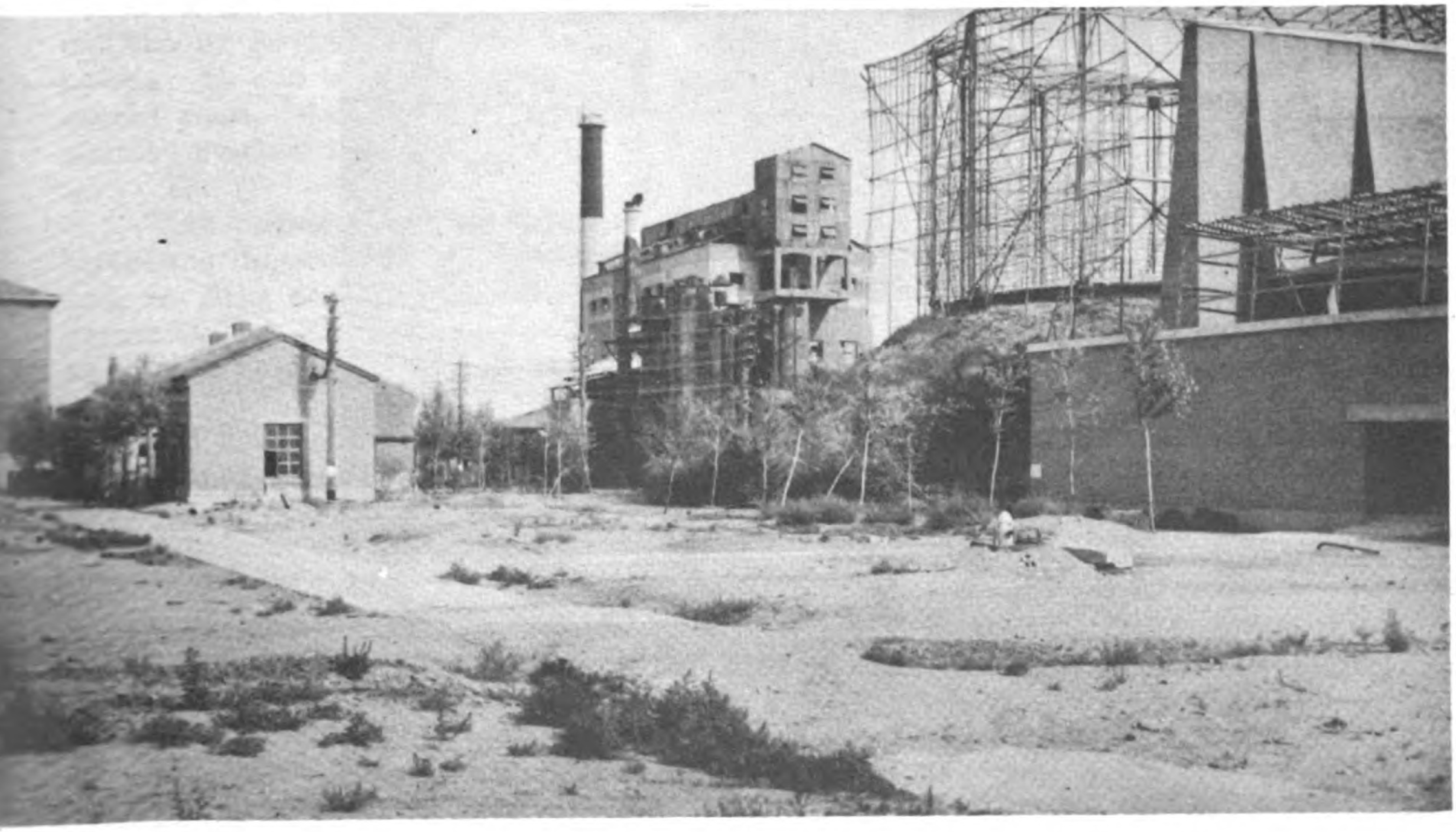
Remarks: The Badger distillation unit was operated since August 15, 1945 by the Chinese provincial government for more than a month using 400 of the 500 tons of Borneo crude oil that was on hand. The Soviets heard of this operation and came back to the plant demanding that the plant be run cooperatively by them and the Chinese Government. The Chinese refused and negotiations were under way when the nationalist armies arrived. Only 100 tons of crude oil are now on hand.

PREPARED BY

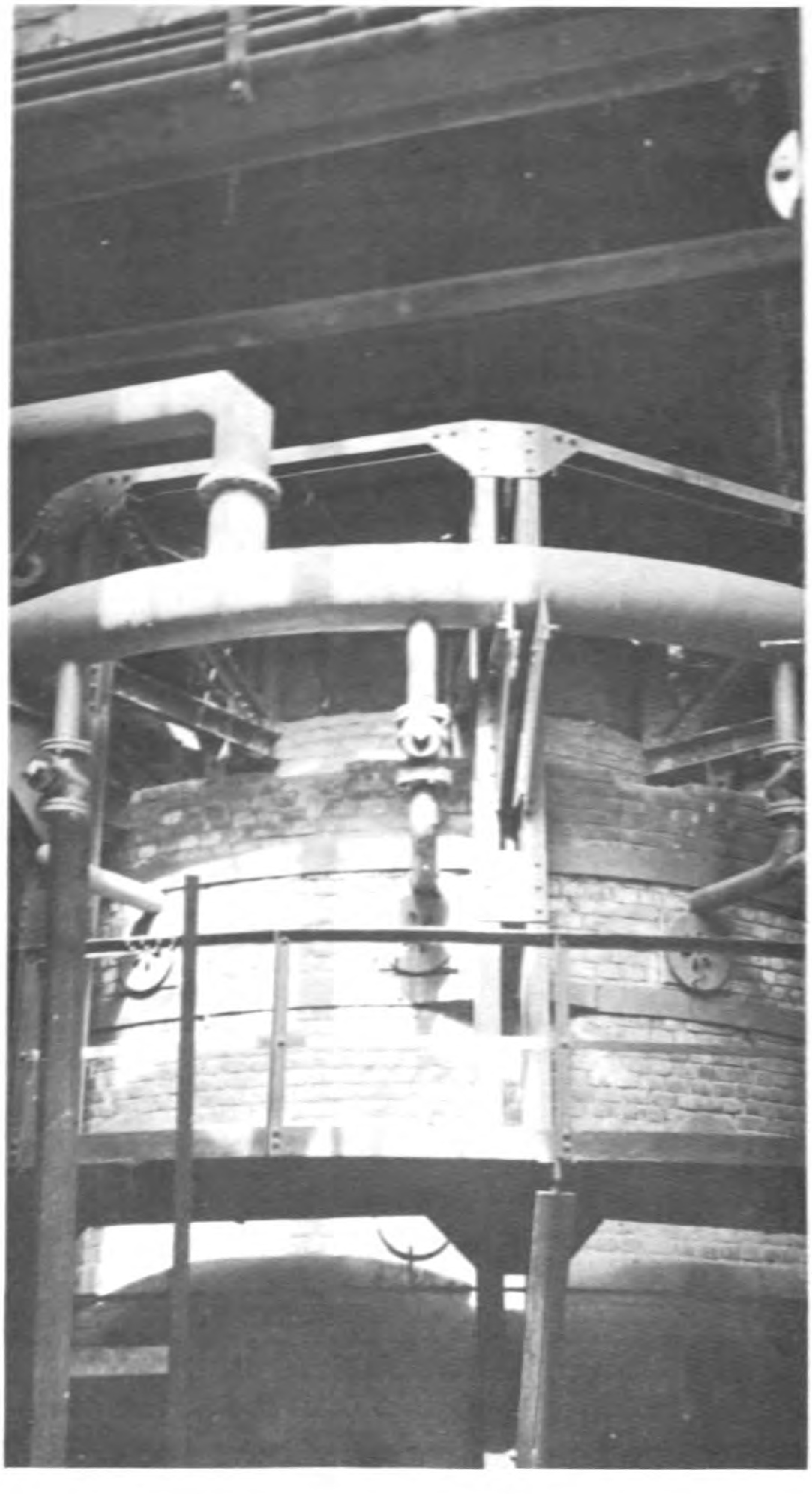
H. M. Thorne



Japanese Army First Fuel Depot - Ssupingchieh
General view of the old section of the plant showing the Badger Fractionating column in the background and product storage in the foreground.



View of the Low-Temperature-Carbonization Plant and gasometer.



**JAPANESE ARMY FIRST FUEL DEPOT, SSUPINGCHEIH**

Catalytic Reactor for cracking methane to produce hydrogen.

Appendix 9

## SUPPLEMENT TO PLANT INSPECTION REPORT 19-E-1

Colonel F. J. Culley, C.O. of the "Cease Fire Team" in Ssupingchieh arranged for an interview with D. Doric Beaulieu, a French-Canadian priest from the local Catholic Mission. This padre had been interned for the entire war in Ssupingchieh and upon being released when the Japanese surrendered witnessed considerable of the Soviet activities during their occupation of the town. His statements in effect were as follows:

"The first Soviet troops reached Ssupingchieh about August 21, 1945. They were an extremely uncouth and undisciplined lot. It was generally understood that these troops were the dregs of the Russian armies and prisoners who had been thrown forward as shock troops with the promise of permanent release from prison if they survived the war. They murdered, raped and looted both the Japs and the Chinese. Their officers were also a rough lot and had little control over their men. I personally saw a Russian officer shoot down a soldier who was creating a disturbance on the main street. These first troops were relieved in about two weeks by better disciplined soldiers. However, the replacements carried on, in a slightly modified manner, the assaults and looting of both Japs and Chinese and gave active encouragement for mobs to do likewise. Any Chinese who had property was considered as much an enemy as were the Japs. I know of one case where the Soviets used a tank to threaten a Chinese who had successfully resisted an earlier effort by Soviet soldiers to lead a looting mob of Chinese into his home. It was my experience with sentries and guards that very few could read. Lawlessness and looting continued during the Chinese Communist regime that followed.

"At present the mission is caring for about 120 Jap orphans and helpless dependents. Local Chinese Christians are particularly helpful in this activity but many non-Christian Chinese are contributing generously. We have applied for UNRRA aid but have been informed that such was not available for relief of Japs.

"I have not seen my Canadian home for over ten years and am hoping that I can be relieved at the mission before long so that I can pay Quebec a visit."

Colonel Culley also arranged an interview with Chyuko Morishige, a young Japanese matron who had been born in Sacramento, California but moved to Manchuria after graduating from Junior High School in that city. Her husband had worked at the Synthetic Fuel Plant during the war. He had acted as an interpreter for Major Davidov, the Soviet officer in charge of the dismantling of the plant. Major Davidov claimed to have lived for 13 years in the United States. Mrs. Morishige appeared quite flustered during her interview and could not remember names or dates in many cases. She said that there had been some attacks on Japanese by local Chinese during the period between the end of the war and the arrival of the Soviets. She said that the first Soviet soldiers to arrive were very bad and broke into Japanese homes to get girls. They had their hair cut very short. The soldiers that followed were better but the attacks and robbing of Japanese continued. She also said that there were more attacks by Chinese on the Japs after the Soviets arrived. The attacks by Chinese continued during the Communistic regime and it was only after the Nationalists took over that there was any reasonable safety for the Japs either on or off the streets.

Colonel Culley offered some observations on this latter point. He stated that the Nationalists had taken an inventory of all goods in the Japanese homes and this inventory was available to the public. If anyone wanted anything on the list they could arrange to purchase it through the government. It was his opinion that the Japanese realized very little from the transaction.

The Colonel read me some of his notes on the treatment of the Japanese at both Ssupingchieh and Kaiyuan. His conclusions are that the Japanese have been pillaged to destitution in a gradually more refined pattern, beginning with the Soviets and ending up with the present Nationalist Government. The Colonel said that he hated Japanese, having been chased around Burma and China for two years by them but that he was beginning to develop a sympathetic feeling for them in Manchuria.

PREPARED BY

Norman Cleaveland

# SYNTHETIC FUEL COMPANY, LTD.
## (Manchu Gosei Nenryo Company, Ltd.)

**Location:** Chinchow, Liaoning Province, Manchuria

**Date Visited:** 8 June 1946 by Messrs. Thorne and Hendricks.

**Source and Reliability of Information:** The major part of the information on the plant was obtained from Mr. Chin, present plant director. The source is believed reliable and the condition of the plant and removals were substantiated by the inspection.

**Date Put in Operation:** May 1944

**Description of Product:** Synthetic crude oil produced by the Fischer-Tropsch process which will yield motor fuel, diesel fuels and wax.

**Previous Production:** The estimated capacity was 30,000 tons per year of synthetic crude oil, but the actual production from May to November 1944, its total operating life, was 140 kiloliters.

**Power:** The power plant is now operating to provide power (2,500 kw per day) for the operation of the molybdenum mine at Yangchiachangtzu.

**Plant Equipment:** The plant contains the following major units:

| | Daily Capacity |
|---|---|
| Synthesis gas plant (Didier type) 96 ovens (only 48 of the above ovens were ever operated) | 1,040,000 cu.m. |
| 10 Gas Producers (3 Chapman-type coal, 7 Koppers-type coke) for heating above plant | 700,000 cu.m. |
| Power Plant, 3 Boilers, 2 Turbine generators | 5,000 kw |
| 3 Gas Holders | 30,000 cu.m. |
| Inorganic Sulfur Scrubbing Unit | |
| Organic Sulfur Scrubbing Unit (Luxmass) | |
| 56 Contact Ovens (Reactors) - 40 completed (est.) | |
| 6 (?) Activated Carbon Absorption Units | |
| Hydrogen Generation Units (Messerschmidt) | 36,000 cu.m. |
| Sulfur Recovery Unit (Zahn) | |
| 2 Fractionation Towers | |
| Product Storage Tanks (est.) | 1,000 bbls. |

**Number of Employees At Full Operation:** The Japanese in Tokyo report the following number of employees during operating period: Japanese, 850; Chinese, 800. One Japanese technician who is being retained at the plant conducted us through the purification and synthesis plant. Other Japanese operators are being retained — the exact number was not reported.

Removals: (of any consequence) The only equipment destroyed or removed from this plant was the control and temperature and pressure measuring instruments, a few electric motors, some conveyor and V-belting, and laboratory and shop equipment. None of these would seriously hamper putting the plant into operation except the control instruments.

The control instruments were destroyed largely by smashing in the face and contained delicate parts with hammers or similar objects. The Chinese technicians stated that the instruments were destroyed by the Japanese, but that the mercury from the instruments was taken by the Soviets. They also stated that some laboratory equipment and machine tools were taken by the Soviet army. The Soviet army occupied this area only about six weeks.

Discussion of Restoration: It is judged to be desirable to operate this plant as a synthetic fuel plant the entire capacity should be put into operation. However, operation of the plant does not appear feasible because of the higher costs and previous unsatisfactory operation.

Equipment Needed for This Restoration: It is extremely difficult to estimate the amount or value of equipment removed as the plant was never completed. The units in the plant that were completed could probably be put into operation by the purchase and installation of essential control instruments and other auxiliaries at a cost of not more than $100,000 to $200,000.

Source of Raw Materials:

(a) Previous — The raw materials in this plant are: Coal (obtained from Fouhsin Coal Mines); catalysts (obtained from Japan); activated carbon (obtained from Japan). Power: The plant generated its own power and electricity (5,000 KW capacity). The power plant was designed to operate on waste heat from gases from the Fischer-Tropsch units and is of the back pressure turbine type (2-1/2 atms). Temporary grates were installed under the boilers firing coal by hand, consequently the plant cannot operate at present under full capacity or efficiency. It is operating at one-half capacity at present generating power for the Molybdenum mine west of Chinhsi (Yangchiachangtzu).

(b) Future — Catalysts: A very small quantity of cobalt catalyst (10 tons) required for the Fischer-Tropsch units is on hand but an additional quantity must be obtained from some source before the units can operate. Japan or the USA would seem the best sources of catalyst. However the cobalt catalyst did not operate satisfactorily so it would seem wise for the Chinese to obtain information on more satisfactory types of catalysts and perhaps do some experimental work before obtaining a very large supply of new catalyst. Three of the Chinese technicians at the plant have studied in Germany and are somewhat familiar with German practice. It was suggested that they contact the Director, U.S. Bureau of Mines, for copies of the technical reports seized from Germany by US Technical Teams. Many of these reports are available for distribution at present and should be helpful in planning future operations.

Stockpiles: Coal — A small amount of coal is on hand but continuous operation of the power plant will require a regular supply from the Fouhsin mine. Present deliveries are adequate.

Former Distribution of Product: Japanese Army 2nd Fuel Depot, Chinhsi.

Immediate Future Demands for Product: Large demand for fuels in Manchuria.

Names of Former Plant Managers: Manchu Gose; Nenryo Company, Ltd. (Japanese) prior to August 1945.

Names of Present Plant Managers: Chinese Economic Commission at present: Mr. Chou, Director; Mr. Ping Chang Chin, acting director.

Process: Coal crushed at the mine to 1-1/4 - 1/4 inch mesh was dumped from coal cars into a concrete storage bin from which it was carried by a belt conveyor — part to the gas producers and part to the Didier ovens. Continuous charging hoppers at the top of the ovens charge the coal to the first section where it is dried by means of the circulation of hot producer gas. The middle sections of the ovens are the coking sections in which volatiles and some tar are removed. The coke then passes to the bottom section where steam and air are injected to produce the synthesis gas (reaction temperature 1,000 degrees C.). This and the middle section are heated externally by burning producer gas.

The synthesis gas, principally carbon monoxide and hydrogen (ratio 1:2) is passed through dust collectors and water spray washers to the gas holder. From the gas holder it passes through the purifying units which remove inorganic sulfur compound by the use of Iron Oxide (5% $NaCO_3$; 95% $Fe_2O_3$, powder), towers and organic sulfides by the use of Iron Oxide — sodium carbonate (30% $NaCO_3$; 70% $Fe_2O_3$, granular).

The purified synthesis gases then pass at substantially atmospheric pressure through the contact ovens which contain the cobalt catalyst. The catalyst is:

100 parts Cobalt oxide
5 parts Thorium
8 parts Magnesium
200 parts Kieselguhu

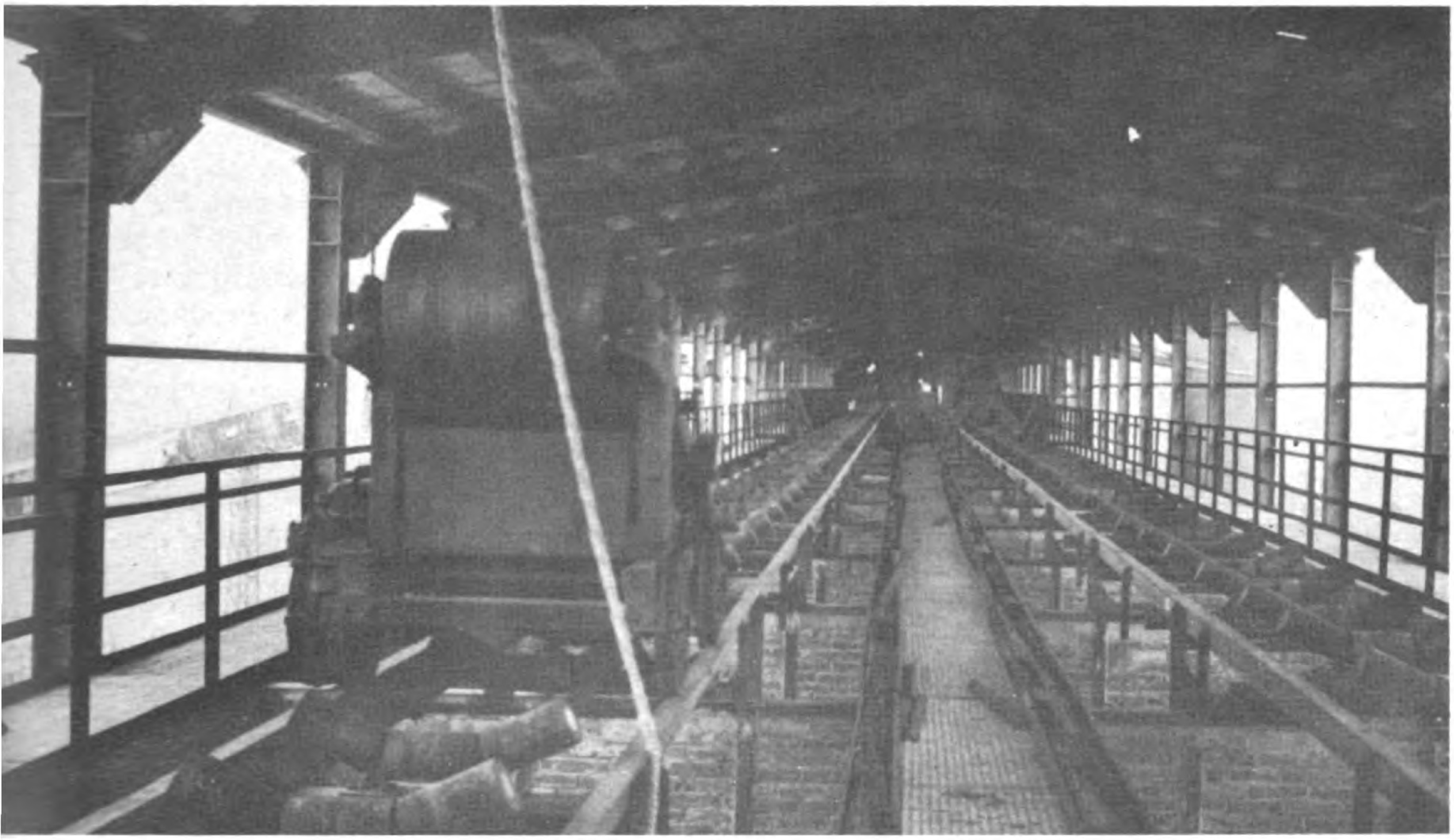
The reaction temperature ranges from [illegible]° to [illegible]° C. The life of the catalyst is 2 to 3 months and this particular catalyst cannot be regenerated according to the Chinese technologists; however, catalysts used in Germany can be regenerated. The Chinese intend to experiment with regeneration. Each oven contains 3 tons of catalyst. Molybdenum or nickel catalysts might prove more satisfactory. The hydrogen and carbon monoxide gases are combined in this step to form liquid products of a wide boiling range.

The heavy liquid products are condensed and the lighter products are adsorbed in the activated carbon absorbers. The absorbers are subsequently purged with superheated steam and the liquid products condensed and separated from the water.

The refining equipment at this plant was never completed and the Chinese report that the crude oils produced at the plant were refined at the [illegible] Plant. The theoretical yield of products is given in the Japanese report (Source File 23-E-1); however, the plant only operated from May to November 19[illegible] and produced only [illegible] Kl. total of crude products. The Chinese technologists report that the plant never operated successfully as the first [illegible] Didier ovens were heated too rapidly causing cracks which allowed air to enter the reaction zone, upsetting the constituent balance and producing poor synthesis gas. The second set of [illegible] ovens was being heated to temperatures more slowly when the war ended.

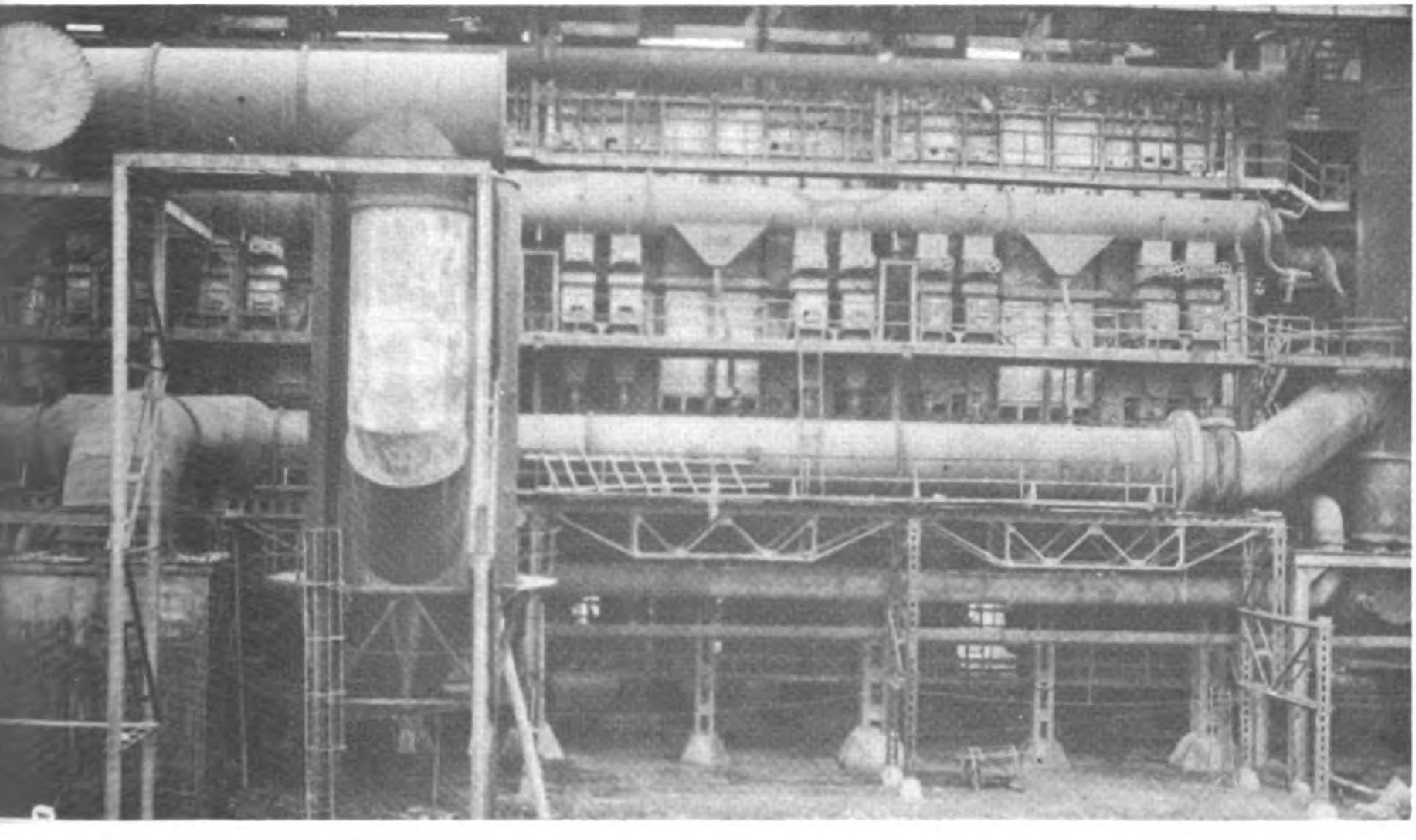
PREPARED BY

H. M. Thorne

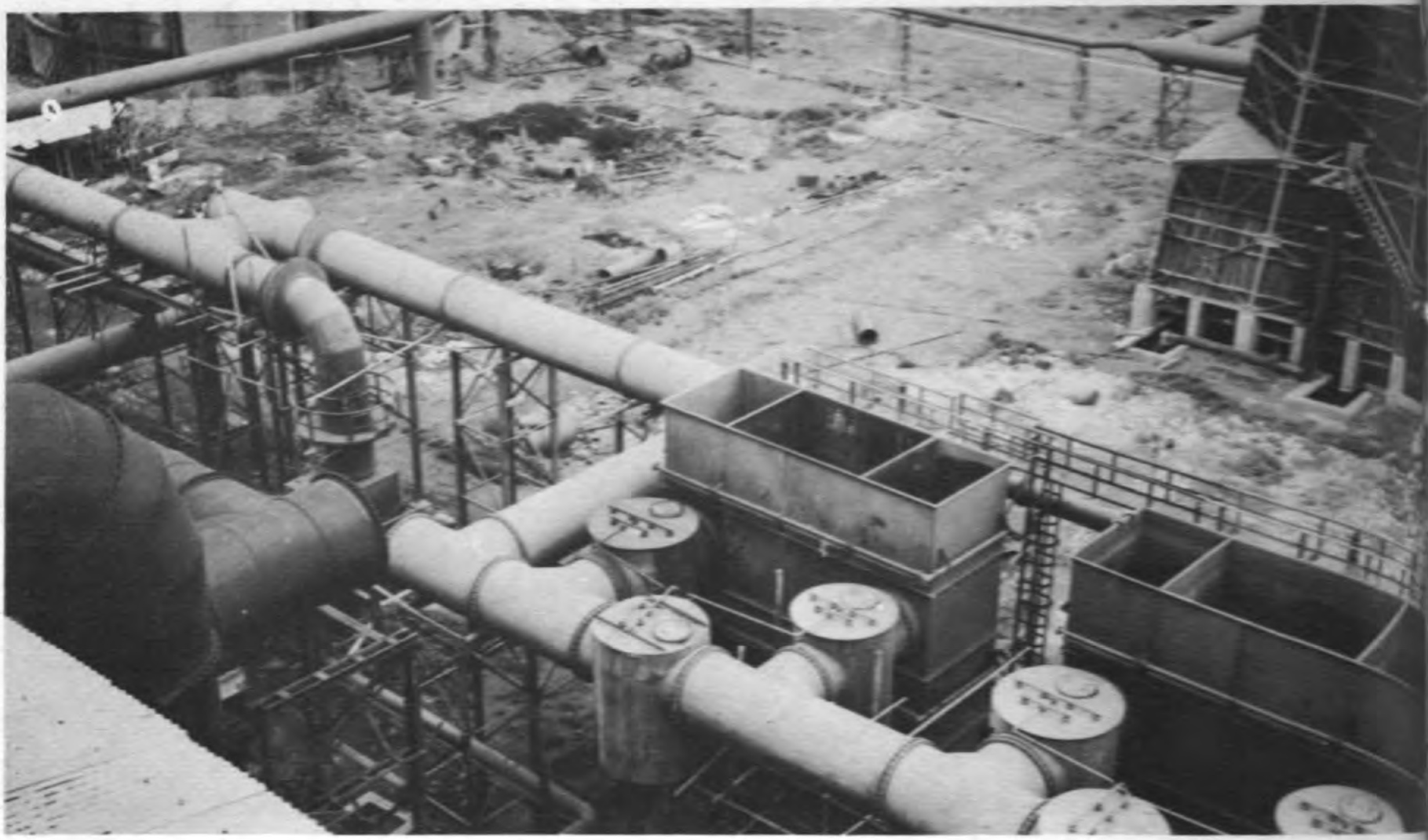


Synthetic Fuel Co., Ltd. - Chinchow

Coal charging mechanism to top of Didier Furnaces for making synthetic fuels by the Fischer-Tropsch Process.

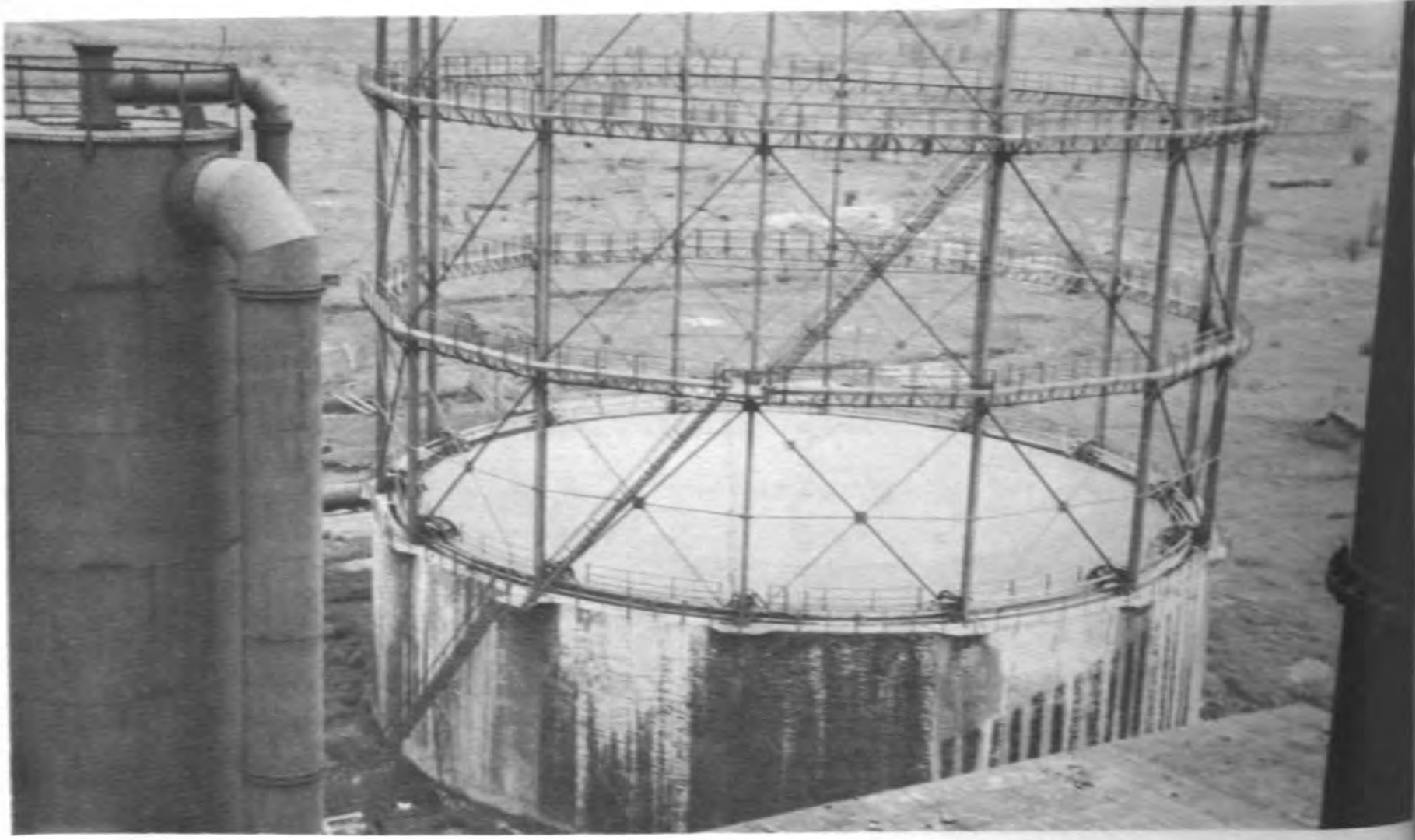


Side view of Didier Furnaces and gas circulation manifold system.



Synthetic Fuel Co., Ltd. - Chinchow

Synthesis gas scrubbing and dust settling system from the Didier Furnaces - Fischer-Tropsch Process.



Gasometer for receiving the clean synthesis gas.

## SOUTH MANCHURIAN RAILWAY COMPANY
## (Oil-Shale Plant - West)

Location: Fushun, Liaoning Province, Manchuria

Date Visited: 3-4 June 1946 by H. M. Thorne.

Source and Reliability of Information: Mr. Tsai and Mr. Li of the Northeast Chinese Economic Commission, Mukden, and Mr. Li, present plant manager furnished the information on processing capacity and removals. These men are believed to be reliable. The present condition of the plant was substantiated by inspection.

References:
(a) JANIS, October 1945, Part II, pages 245-47.
(b) Petroleum Facilities of China, Manchuria and Korea, Report of Office of Quartermaster General, July 1945, pages 45-49.
(c) Proceedings—Oil, Shale and Cannel Coal Conference, June 1938, pages 267-71.
(d) Chinese Economic Commission Summary Report, Part 3, page 2, (Appendix 2e).
(e) Report on Operations at Fushun District by Mr. Chin, Manager of SMR Co., Fushun Operations (Source File 1-I-1).

Date Put in Operation: Plant No. 1, 1929; Plant No. 2, 1942; Plant No. 3, 1944.

Description of Products: Gasoline (motor and aviation), light oils, diesel oil, heavy oils, lubricants, crude wax, refined wax, greases, ammonium sulfate, and sulfuric acid.

Best Previous Production: The highest yield of petroleum substitute products was 1,317,300 barrels in 1943.

Plant Equipment: Two shale crushing and screening plants; 2 shale retorting plants (140 retorts); 2 crude oil distillation plants; 2 batteries of coking stills (56); 2 Dubbs cracking units; 2 products treating plants, synthetic lubricants unit; 2 steam boiler plants; 2 ammonium sulfate concentration plants.

Number of Employees at Full Operation: 4,250, of which 3,600 were Chinese laborers and 650 were Japanese, primarily staff members.

Removals: Only a few small electric motors and some stock belting were removed from this plant.

Comments on Restoration: The plant can operate at normal capacity with the restoration of a few electric motors and a small quantity of belting.

Equipment Needed for This Restoration: Rubber conveyor belting and small electric motors.

Source of Raw Materials: Oil-shale lying above coal in Fushun open pit mine.

Stockpiles: Small quantity of shale in bins.

Former Distribution of Product: Most of products taken by Army and Navy for fuels and lubricants--small quantity sold on open market.

Immediate Future Demands for Product: There is an immediate demand for all petroleum products in Manchuria.

Names of Former Plant Managers: Mr. Hasegawa Sei Yu

Names of Present Plant Managers: Dr. S. C. Li (Northeast Chinese Economic Commission) Fushun.

Notes on Process: The oil-shale plant (west) is divided into plants No. 1 and No. 2. Plant No. 1 is the original oil-shale plant put into full scale operation in 1929. Plant No. 2 was constructed and put into operation sometime after 1938. Plant No. 3 was constructed in about 1944. This plant, located some 8 km east of the present plant, known as the "East" plant is not included in this report as it is held by Chinese Communists; consequently, its condition is unknown. However, the Northeast Chinese Economic Commission reports that some of the facilities have been removed by the Soviets and additional destruction has been made by the Chinese Communists.

Retorting: The original retorts in Plant No. 1 and the newer retorts in Plant No. 2 operate on the same principle, the difference being only in size. The principle is similar to that of gas producers for the recovery of tar and the retort consists of two cylindrical sheet iron receptacles lined with refractories. These were superimposed and connected by a narrow section in the form of a truncated cone. The fixed carbon was burned in the lower section by the injection of steam and air and the resulting gases pass through the upper section which functions as a distillation retort. Thus the retorting zone is internally heated. Due to the low fixed carbon content (about 4%) the gas furnished by the lower section is insufficient to carry out complete pyrogenation of the shale. Consequently part of the distillated gases are recycled at the base of the top section after being freed of condensible vapors and reheated in the brickwork heating chamber located between each two retorts. This part of the heating is external. The distillation section has an internal diameter of 2.6 meters and a volume of 20 cubic meters. The lower or producer section has a diameter of 3 meters and a volume of 27 cubic meters.

The constricted section between the two portions of the retort was later enlarged allowing a doubling of the throughput of the retort. The newer retorts are constructed according to the new design.

The oil-shale crushed and screened to 5 to 2 cm is carried by a belt conveyor to individual hoppers above each retort. Shale is fed continuously into the top of the retort and, after passing through the distillation and producer zones, the spent shale is removed from the bottom by a revolving grate.

The distillation zone is maintained at approximately 500 degrees Centigrade and the producer zone at about 900 degrees Centigrade. The gases and vapors are removed from the top of the retort and drawn by means of an exhaust fan through a dilute sulfuric acid scrubbing solution. The oil vapors which did not condense in the scrubber are removed in cyclone separators and condensers.

The fixed gases are recycled to the center of the retort after passing through a checkerboard heater (part of the gases are burned to provide the heat). The hot gases (500 degrees Centigrade) pass upward through the retort providing part of the heat for the retorting process.

Sulfuric acid is added to the gas washer to form ammonium sulfate which is withdrawn from the washer and crystallized to solid ammonium sulfate in another portion of the plant.

The crude oil separated from the primary washer and the secondary condenser (cyclone separator) is pumped to refinery storage.

A portion of the crude oil is cracked in a Dubbs Unit (850 bbl/day capacity Plant No. 1) and the remainder topped with the bottoms going to coking stills.

Naphthas from the various sources above are treated with sulfuric acid and neutralized with caustic soda. The naphtha is low in octane number (40-60) and high in sulfur (0.3%). The medium oils were used principally for diesel oil for small fishing boats or occasionally cracked to gasoline in the Dubbs unit. The bottoms were vacuum distilled into wax distillate, heavy oil and tar. Wax distillate is chilled, pressed and the wax treated with sulfuric acid and decolorized with acid-clay or activated carbon. The heavy oils were sold for fuel.

A small unit for synthesizing lubricating oil is operated at the plant using aluminum chloride as a catalyst. Light oils (150-300 degrees Centigrade) are cracked in the Dubbs unit and the unsaturates polymerized to lubricants. The lubes are acid treated and neutralized with caustic soda. An average distribution of products is shown in Mr. Chin's report (Source File 1-I-1).

Remarks: The plant is in operating condition, but had been operating at reduced capacity, due to shortage of mining machinery, since August 15, 1945, and at present is shut down as no electric power is available. A few electric motors and stocks of belting were reported to have been taken by the Soviets. However, most of the belting remains on the conveyors and motors.

Although the plant is in operating condition, it is quite "run-down" needing considerable repair and replacement. Most of the equipment is of antiquated design.

PREPARED BY

H. M. Thorne

# JAPANESE ARMY SECOND FUEL DEPOT

**Location:** Chinhsi, Liaoning Province, Manchuria

**Date Visited:** 9-10 June 1946 by Messrs. Thorne, Hendricks, Martin and Capt. Scott.

**Source and Reliability of Information:** Information regarding plant facilities, removals, and operations was obtained from the Northeast Chinese Economic Commission, Summary Report, Part 3, page 1, (appendix 2e), and from Mr. Hou, plant director. These sources appear fairly reliable and the present status of the plant was confirmed by the inspection.

**References:** (a) JANIS, Chapter IX, October 15, 1945, Part II, pages 247-252
(b) Petroleum Facilities of China, Manchuria, and Korea, Report of the Office of the Quartermaster General, July 1945, pages 55, 57 and 61.

**Date Placed in Operation:** 1943

**Description of Products:** American sources refer to this plant as a low temperature carbonization plant. It does contain a small LTC Unit, but the major facilities are devoted to refining petroleum and the production of synthetic aviation gasoline from butanol and synthetic lubricants from soya bean oil. It also produces ethyl alcohol, coal tar products, coalite and manufactures drums.

**Production:**

| | | | |
|---|---|---|---|
| Products - Design capacity - | | aviation gasoline | 200,000 Kl/yr |
| | | motor | 100,000 " " |
| | | aviation lube oils | 6,000 " " |
| | | absolute alcohol | 10,000 " " |
| | | iso-octane | 40,000 " " |
| | | other fuels | 200,000 " " |
| Actual throughput - | | | |
| | Crude oils | 1942 | 2,000 " " |
| | | 1943 | 18,000 " " |
| | | 1944 | 2,000 " " |
| | | 1945 | None |
| | LTC - coal | 1943 | 2,000 tons |
| | | 1944 | 54,000 " |
| | (to Oct.) | 1945 | 48,000 " |

Plant Equipment and Processes: Construction of the plant was started in 1941. The LTC Unit operated about 2 years. The petroleum refinery started trial operation in 1943 and ran 18,000 kiloliters of Sumatra crude oil (only one shipment of crude ever received). Two thousand (2,000) kiloliters were processed in 1944 and none in 1945. A synthetic lubricating oil plant using soya bean oil as the raw base stock was never completed. A unit for the synthesis of butanol into iso-octane was not completed. An ethyl alcohol plant to produce alcohol by fermentation of corn was practically completed but did not operate. A gas producer plant operated for a short time. The products treating plant using sulfuric acid and caustic soda with Doctor sweetening is complete and capable of operation with the exception of control instruments. An electrolytic plant for producing hydrogen and oxygen was completed but control instruments and a rectifier were badly damaged. Shop facilities and machine tools were partly removed. A large barrel (drum) manufacturing and cleaning plant is largely intact.

Petroleum Refinery: The topping plant has a capacity of 3,000 barrels per day of crude oil and consists of a pipe still, an evaporator, two fractionating towers, a stabilizer tower and auxiliary pumps, heat exchangers and condensers. The Unit is intact and of modern design but lacks control instruments, some pump parts and electric motors. The Chinese manager reported that the hot-oil pumps never operated satisfactorily. The equipment appears to be of conventional American design but was manufactured in Japan.

The cracking unit is a Dubbs non-residuum two-coil type but was manufactured in Japan. It has a rated capacity of 700 barrels per day. The pipe-still uses the conventional two-coil system and feeds into one of 3 vertical reaction chambers. Cable is wound in each chamber for coke removal. The vapors from the reaction chamber pass to an evaporator and to a fractionating tower and a stabilizer. The hot oil pumps were reported unsatisfactory. All control instruments were damaged and some motors and belts were missing.

Both the straight-run and cracked naphthas were treated by sulfuric and caustic soda washing and the cracked gasoline was given an additional Doctor sweetening in the treating plant. The sulfuric acid treater is a continuous counter-current acid and naphtha type using orifice plate mixers. It was operated at atmospheric temperature. A finished gasoline re-run distillation unit was located at the treating plant.

Low-Temperature Carbonization Plant. This plant is of the usual Japanese type which is an adaptation of the German Lurgi furnaces to the low grade bituminous coals produced in this area. The plant was to have two batteries of furnaces each having a capacity of 300 tons per day of coal. Only one battery was complete but it operated for about two years. The yield of liquid products was very low because of the type of coal available. On a weight basis the yields of products were:

| | Percent |
|---|---|
| Benzol | 1 |
| Medium Tar | 2 |
| Heavy Tar | 3 |
| Coalite (coke) | 60 |
| Gas | 34 |

The plant is intact and capable of operation with little repair. The principal equipment missing is control instruments and small electric motors.

Gas Producer Plant. This plant is completed and contains 6 producers made in Japan but copies from the Gas Corporation equipment in England. Four small boilers are in the plant for producing the required steam for the water gas reaction. The electric and control instruments are damaged and some small motors are missing.

Iso-Octane Plant: This plant is only partly completed. It was to synthesize iso-octane from butanol in the following manner:

(a) Dehydrate and isomerize butanol into butylene and iso-butylene (30%) at substantially atmospheric pressure using phosphoric acid as the catalyst.

(b) Polymerize (alkylate) butylene and iso-butylene into di-iso-butylene and hydrogenate at 350° C. to iso-octane at 16 atmospheres pressure using a nickel catalyst.

Electrolytic Hydrogen Plant. This plant is quite modern, neat in appearance and appears practically intact except for small electric motors for the compressors, V-belts, control instruments and the large rectifier for converting AC to DC has been damaged. Seven hundred (700) kilograms of mercury was reported by the Chinese manager to have been taken by the Soviets.

The plant contains 432 electrolytic cells capable of producing 800 cubic meters of hydrogen a day. It could be operated within a short time as 3 - 40 kw. AC-DC generators are available for furnishing the required electric current for the cells.

Synthetic Lubricating Oil Plant: This plant was never completed; however, most of the equipment necessary for operation is on hand. The process is as follows:

(a) Dehydrate and hydrogenate (single operation) the soya bean fatty acids into olefins at 330° C. and 70 atmospheres pressure using zinc oxide and zinc chloride as catalysts. The plant capacity is 40 tons per day of fatty acids.

(b) Purify the olefins by treatment with lime and vacuum distillation to remove unreacted fatty acids and esters. The capacity is 70 kiloliters per day.

(c) Polymerize olefins into paraffins (predominant) at 150° C. and atmospheric pressure using aluminum chloride and naphthalene as the catalyst. The product is neutralized with caustic soda and washed with hot water to remove aluminum chloride.

(d) Distilled under vacuum in Badger type column. The vapors are treated with acid clay to polymerize and remove olefins. Refined aviation lubricating oils are produced.

Equipment needed to put plant into operation:

Vacuum filter to remove lime
Still heater tubes
Hydrogen compressor
Motors for pumps

The plant is estimated as 70 per cent completed. Its capacity was to be 60 tons of lubricants per day.

Drum Plant: This plant is partly completed and was to have produced 700 drums per day.

Laboratory: The laboratory was completely stripped of equipment and a Japanese-made octane test engine was badly damaged.

Employees: It is reported by the present Chinese manager that during the construction and operation of this plant only Japanese technicians and workmen were used with the exception of a few Chinese coolies used on common labor. The details of plant design were very closely guarded, consequently, there are no Chinese familiar with the operation of any part of the plant.

No record of the number of employees is available. An estimate of 3000 is based primarily on the living quarters constructed for plant employees.

Equipment Removal: Actually very little equipment was removed from this plant. The majority of the installations were not completed by August 1945.

It was reported by the Chinese plant manager that some heavy machinery and equipment (principally machine tools) were taken by the Soviets, as well as electric motors, belts, laboratory equipment and mercury. It was likewise stated that most of the damage to control, temperature and pressure measuring instruments was done by the Chinese populace at the instigation of the Soviet Army.

Because of the unfinished condition of the entire plant, it is difficult to determine whether an item was removed or whether it had ever been installed. The weight, percentage removal and value of the equipment removed is reported by the Northeast Chinese Economic Commission in Source File 202-E-1.

Raw Materials and Power:

| Raw materials | Source |
|---|---|
| Petroleum | Sumatra (none after 1944) |
| Coal | Fouhsin and Fushun coal mines |
| Butanol | Japan |
| Soya Bean Oil | Various Manchurian sources |

Power: The plant has a very modern powerhouse containing one nearly completed boiler and a second under construction. Boiler fuel is coalite from the LTC unit. A turbo-generator of 15,000 KVA capacity is completely installed. As soon as some minor repairs can be made to the first boiler the generator can be operated by using coal as fuel instead of coalite.

Former Plant Management: This plant was constructed and controlled by Japanese Army to August 1945.

Present Plant Management: The Northeast Chinese Economic Commission has control of the plant. Plant Director - Mr. Hou, An-kai (also Director Chinchow Office - Ministry Economic Affairs). Plant Manager - Mr. Sun.

PREPARED BY

H. M. Thorne

# SOUTH MANCHURIAN RAILWAY CHEMICAL FACTORY

Location: Mukden, Liaoning Province, Manchuria

Date Visited: 1 June 1946 by Messrs. Thorne, Cleaveland and Lt. Col. H. G. Schenck.

Source and Reliability of Information: Report on Manchurian industries prepared by the Northeast Chinese Economic Commission, Mukden, and verbal statement of the former Japanese manager at the plant. The information sources are considered fairly reliable and information on the status of equipment was confirmed by inspection.

Date Placed in Operation: 1940

Description of Products: Caustic soda, chlorine, hydrochloric acid, aluminum chloride, and steam cylinder lubricants.

Capacity:

| | | | | | | |
|---|---|---|---|---|---|---|
| Caustic soda | - 3,000 | metric | tons | per | year | (1/) |
| Chlorine | - 3,000 | " | " | " | " | (2/) |
| Hydrochloric acid | - 6,000 | " | " | " | " | (1/) |

(obviously too high - probably less than 3,000 tons)

Aluminum chloride - 90 metric tons per year (2/)

Actual production of products during April, May, June and July 1945 is given in Source File 1-C-1.

Plant Equipment as of August 15, 1945: 100 - electrolytic cells, brine solution vats, chlorine scrubber, chlorine compressors, hydrochloric acid burners and absorbers, aluminum reaction tower, caustic soda concentration unit, and various packaging and warehouse buildings.

Employees: 800 to 1,300 when operating 2 or 3 shifts respectively (includes employees in the oil-shale part of the plant).

Removals: No equipment was removed from the plant. However, it was stated by the former Japanese manager that the Soviets took over 2,000 tons of coal and various small items of clothing and supplies. For a detailed list of removals see Source File 202-C-1.

Immediate Future Demand for Products: This plant is the only caustic soda plant in Manchuria now capable of operation (1/). It should be put into operation as soon as electric power is available. No additional equipment will be required.

Present Plant Manager: Mr. Tsai, Northeast Chinese Economic Commission.

Soviet Officials at Plant during Period of Removals: Mr. Liecenko and Mr. Almazhamar.

Process: Caustic soda and chlorine are produced by the electrolytic process from salt, shipped in from the saltpan (seawater) plants near Dairen. The plant contains 100 electrolytic cells in use and space for about an equal number for future expansion. The caustic soda is packaged in iron drums. Part of the chlorine is used in treating shale-oil wax to produce finished wax and synthetic lubricating oils. The remaining chlorine is bottled or converted to HCl as the need exists. Aluminum chloride was made by contacting metallic aluminum with HCl. The aluminum chloride was shipped to Fushun to be used as a catalyst in the oil shale refinery. Most of the HCl from the plant was utilized by a soy bean sauce factory adjoining this plant, for the production of various soy bean products.

Remarks: Practically nothing has been removed or destroyed in this plant. It may be operated as soon as sufficient electric power is available. Although the plant is quite new much of the equipment is in poor condition due to lack of care.

PREPARED BY

H. M. Thorne

## MUKDEN ARSENAL - SMOKELESS POWDER PLANT

Location: Mukden (5 km east of Arsenal), Liaoning Province, Manchuria

Date Visited: 2 June 1946 by H. M. Thorne and Dr. Kou of the Northeast Chinese Economic Commission, presently in charge.

Source and Reliability of Information: The former Japanese manager, conducted the tour of inspection and supplied the information on equipment, capacity and destruction. The source of information is believed to be fairly reliable. Evaluation of the information supplied should be classified as possibly true. The extent of the destruction was verified by the inspector.

Date Placed in Operation: 1944

Product: Smokeless Powder - 50 metric tons per month
Trainer airplanes - very few

Plant Equipment as of August 15, 1945: The number and type of machines for processing was not determinable because of the complete destruction of the plant. There were approximately 20 buildings which contained equipment for washing the cotton, digesting the washed cotton with nitric acid to form nitrocelulose, neutralizing and working the product, dissolving the nitrocellulose in ether and extruding or pressing into various forms of gun powder. The plant also contained an ether recovery unit and a large machine shop.

Removals: The plant is completely destroyed except for a few office buildings and employees living quarters. It is apparent that some machinery, particularly machine tools were removed from the plant before destruction. The Japanese manager stated that these machine tools and equipment were removed by the Soviets.

Destruction: The former Japanese manager stated that the plant was exploded by the Soviets on January 4, 1946, four tons of explosives (TNT) being used. The powerhouse, boiler plant and various processing buildings were destroyed by explosives. Much of the equipment remains in the plant but that which was not wrecked by the explosions has been wrecked by breaking or bending with sledges or other heavy instruments. Hundreds of bales of cotton are strewn around the plant grounds. It is evident that explosives were detonated in each building.

Present Management: Dr. Kou - Chinese Arsenal Manager, Northeast Chinese Economic Commission.

Process: The usual process of nitration of cotton to produce nitrocellulose--washing, purifying and the extrusion of pressing of the nitrocellulose into various sizes and shapes for use in artillery and small arms ammunition.

Remarks: Although the above description of the method and source of destruction of the plant is probably true, it was noticeably different from most other plants in the Mukden area, in that no Russian writing or signs were in evidence. The plant could have been destroyed by Chinese communists or others equally as easily.

PREPARED BY

H. M. Thorne

## MANCHU OIL AND FAT COMPANY, LTD.

**Location:** Mukden, Liaoning Province, Manchuria

**Date Visited:** 2 June 1946 by Mr. H. M. Thorne

**Source and Reliability of Information:** The information regarding the plant was supplied by Japanese familiar with the plant, and from the report on Manchurian industries by the Northeast Chinese Economic Commission, Mukden. The sources are fairly reliable and the information was confirmed on inspection.

**Plant Placed in Operation:** 1940 (?)

**Products:** Soaps, fatty acids, glycerin candles and synthetic lubricants.

**Capacity as of August 15, 1945:**

Soaps (laundry, toilet, flakes, powder) - 5,000 MT per year
Glycerin (94%) - 300 tons per year
Candles (from Stearin) - capacity not known
Fatty acids (additives for lube oils) - not known
Synthetic Lubricants - capacity not known

**Plant Equipment:** Saponification vats, extruders, cutters, flaking machines, hydrolyzing tanks, washers, distillation columns, candle molds, catalytic cracking, polymerization and fractionating unit for lubricants. The equipment is antiquated in design and is in rather poor condition due to neglect. However, it may be operated for some time to supply soap which is badly needed in this area.

**Employees:** 300 to 350 normal operation; 50 at present.

**Removals:** This plant was occupied by the Soviets until May 7, 1946. When they left (by Chinese army escort) nothing was destroyed and the plant was operating. 20,000 cases of toilet and laundry soap taken by Soviets and 1,500 tons of hardened oil sold in the market in Mukden by them. $500,000 (gobi) worth of soap sold in market. See Source File 202-C-1 for a detailed list of removals.

**Source of Raw Materials:** The raw hardened soya bean oil was obtained from the soya oil plant at Dairen, which is the only source of hardened oil in Manchuria.

**Stockpiles:** A small quantity of hardened oil and approximately 100 tons of cocoanut oil is on hand. These stocks are sufficient for only a few weeks operation at normal capacity. There is no stock of finished products on hand.

Former Distribution of Product: This plant is the only remaining glycerin plant in Manchuria and supplied 50 to 60 per cent of all the soap requirements of Manchuria.

Immediate Future Demands for Product: There is at present a shortage of soap throughout Manchuria so the need for products from this plant is great.

Present Plant Manager: Mr. Tsai, Northeast Chinese Economic Commission

Processes: Soaps are made by saponification of hardened soya bean oil with caustic soda. Also toilet soaps with different mixtures of soya bean and cocoanut oils.

Glycerin is made by hydrolyzing hardened soya bean oil at 120 lbs. pressure and 130° C, then treating with caustic soda or soda ash, then distilling. There are also four German-made units for hydrolysis using sulfuric acid and naphthalene.

A unit for the esterification of 1,000 tons per year of fatty acids, using alcohol to produce esters for foodstuffs and glycerin, was about 80 per cent completed at the end of the war.

Synthetic lubricating oil is made by cracking soya bean oil and polymerizing to heavier oil and fractionating—a very small unit.

Removals: Plant is practically intact and can operate when electricity becomes available. They are now making 20 to 30 boxes of soap per day by hand. This plant should be put into operation as soon as power is available. However, obtaining of hardened soya bean oil for raw material may become a problem. This plant was formerly supplied by the oil hardening plant at Dairen. Future supplies may not be available from this source as Dairen is under Russian control.

PREPARED BY

H. M. Thorne

## MANCHU SHOKO GLASS MANUFACTURING COMPANY

Location: Mukden, Liaoning Province, Manchuria

Date Visited: 2 June 1946 by Mr. H. M. Thorne

Source and Reliability of Information: The information on equipment and production and on removals was obtained from the following sources:

(a) Report on Manchurian Industries by Northeast Chinese Economic Commission, Mukden.
(b) Report from Japanese sources, Tokyo

The above sources are believed to be fairly reliable and the present condition and removals of equipment were substantiated by the inspection.

Date Placed in Operation: 1940

Product: Sheet glass - window panes

Capacity as of August 15, 1945:

300,000 cases - window panes per year
480,000 cases - window panes per year
456,000 cases - window panes produced in 1944

Equipment as of August 15, 1945: The principal equipment in this plant was:

7 - Sheet glass forming machines (Fulcoul type)
1 - Glass melting furnace
1 - Fire brick manufacturing unit
10 - Glass cutting machines
1 - Annealing furnace
1 - Gas producer unit
1 - Boiler house
1 - Laboratory
1 - Office Building
Warehouses
Miscellaneous conveyors and packaging equipment

Employees: 380 to 400 when operating at capacity.

Removals: Cutting and polishing machinery and packaging facilities had been removed, also all electric motors. The Northeast Chinese Economic Commission reports that the 10 cutting machines were removed by the Soviets. The other equipment removals were probably made by the local populace. The furnaces (7), gas producer plant, coal and raw materials charging equipment and some stocks of limestone and glass were intact except for electric motors and belting. However, the factory had been looted and much of the equipment was damaged. The laboratory and offices had been completely stripped.

Destruction: All stocks of finished products were broken and strewn over the plant. Parts of many of the remaining machines were missing or broken apparently by looters.

Comments on Restoration: The former capacity can be restored by the acquisition of electric motors, belting and cutting machines.

Source of Raw Materials: Scrap glass was purchased locally, but new glass sand was imported from Korea. Soda ash and limestone was obtained from Dairen. Coal was obtained from Fushun.

Stockpiles: A small quantity of limestone and scrap glass was in place at the plant at the time of inspection.

Distribution of Product: It was reported that the sheet glass product was sold throughout Manchuria.

Immediate Future Demands for Product: This plant is reported to be the only sheet glass factory in Manchuria. Sheet glass is badly needed so this plant should be put into operating condition if it is possible to obtain the needed parts and equipment.

Present Plant Manager: Custody of the plant has been taken over by the Northeast Chinese Economic Commission.

Process: Fulcanol Type. Scrap glass and perhaps some glass sand fluxed with limestone was melted in the furnaces. A quantity of molten glass was drawn up from the furnace through a series of rolls which formed the glass into a flat sheet. The sheets were cut into sections—the sections were placed in carriers or racks and moved mechanically through an annealing furnace. From the annealing furnace they passed on rolls to tables where they were cut into sheets of the desired sizes and packaged. The factory contains its own gas producer to produce gas for furnaces.

Remarks: The gas producer plant seemed to be in operable condition except for electric motors. The glass processing part of the plant was in poor condition because of poor care and in addition most of the small pieces of equipment including motors, glass-cutting equipment and packaging equipment is missing. Buildings are in serviceable condition with minor repairs.

PREPARED BY

H. M. Thorne

## MANCHU FERMENTATION WORKS

Location: Mukden, Liaoning Province, Manchuria

Date Visited: 2 June 1946 by Mr. H. M. Thorne

Source and Reliability of Information: Information regarding the plant construction, operation, and production was obtained from the following sources:

(a) Report on Manchurian Industries prepared by Northeast Chinese Economic Commission, Mukden.
(b) Japanese former manager of plant who is also at present managing the operation of the plant under direction of the Chinese Commission. The source of information is fairly reliable and the plant condition was substantiated by inspection.

Date Placed in Operation: The plant was constructed in about 1935 as a sugar refinery. It operated as such until October 1945 when, under Soviet control, it was converted to a fermentation alcohol plant. It is now operating at one-half capacity.

Products: 95 per cent ethyl alcohol and a small quantity of synthetic liquors.

Capacity as of June 2, 1946:

1,200,000 gal/yr. of 95 per cent ethyl alcohol
Small quantity of synthetic whiskey and other liquors

Equipment: Grain grinding and mixing equipment, cooling vats, fermentation tanks, settling and filtering equipment, 2 distillation units, power plant, 2 - 150 KW generators, miscellaneous packaging equipment and warehouses.

Employees: 450 when operating at capacity; 300 working at present.

Removals: 2 cars, 2 trucks, lumber, chlorine and 600 cases whiskey taken by Soviets (See Source File report 202-C-1).

Destruction: Only a small amount of damage was done to living quarters by the local populace.

Sources of Raw Materials: Grains all purchased in the Mukden area.

Immediate Future Demand for Product: The plant should continue operation because of the need for substitute fuels and the need of alcohol for solvents and other normal purposes.

Name of present Plant Manager: Mr. [illegible] under the direction of the [illegible] [illegible] [illegible].

[illegible]: [illegible] [illegible] [illegible], [illegible] [illegible] [illegible] hours, [illegible] [illegible] and [illegible] [illegible] [illegible] [illegible]. [illegible] [illegible] [illegible] the [illegible] [illegible] and [illegible] [illegible] [illegible] per [illegible] [illegible]. The plant was [illegible] [illegible] [illegible] [illegible] a sugar manufacturing plant using sugar cane grown in the [illegible] [illegible] [illegible] [illegible] [illegible] in [illegible] [illegible] [illegible].

Damage: The plant was [illegible] by the [illegible] on August [illegible], 1945, and [illegible] by them on [illegible] [illegible], [illegible]. The plant was in partial operation during that period. The [illegible] is now [illegible] for [illegible] [illegible]. [illegible] [illegible] [illegible] [illegible] [illegible] is due to shortage of [illegible]. The plant has its own power and electric generating plant - 2 - [illegible] KW capacity generators. The plant was constructed in [illegible] as a sugar refinery.

[illegible]

[illegible]

## MANCHURIA PAINT COMPANY

**Location:** Mukden, Liaoning Province, Manchuria

**Date Visited:** 6 June 1946 by Lt. H. A. Fisher and Capt. A. Santelli

**Source and Reliability of Information:** Information on the production and removals from this plant was obtained from the Report on Manchurian Industries by the Northeast Chinese Economic Commission. The source of information is believed fairly reliable and the condition of the equipment was confirmed by the inspection.

| | | |
|---|---|---|
| **Capacity:** | Oil paint and varnish | - 300 tons per month |
| | Soya bean oil | - 10 " " " |
| | Lacquer | - 30 " " " |

**Removals:** Very little had been removed. In November 1945, the Soviets removed some paint and took a few belts from the machines. The power plant, hydraulic presses, and zinc oxidation machinery are all intact.

**Name of Present Plant Manager:** Mr. Li, Northeast Chinese Economic Commission.

**Names of Soviets in Charge of Equipment Removal:**

Lt. Col. Chugurieff, Technical Officer
Captain Turujin, " " (spelling phonetic)

**Remarks:** Though relatively a small plant, the Manchuria Paint Company is the largest of its kind in the Mukden area. Its condition is largely indicative of that of the four smaller plants in this area. With electric power provided this plant is able to start immediate production.

PREPARED BY

Lt. H. A. Fisher

# TON YAN TIRE INDUSTRY COMPANY

Location: Mukden

Date Visited: 2 June 1946 by Mr. Martin accompanied by Mr. Koa of Northeast Chinese Economic Commission.

This plant was equipped for production of industrial belting and tires from raw cotton and raw rubber. It also had small leather goods and asbestos sheet goods plants. It employed 270 Japanese and 1,500 Chinese. It has been completely stripped except for a battery of about 30 tire molding machines, and two out of five heating kilns for tire molds. The boilers and electrical generators and transformers have all been taken, including a stock of about 3,000 finished tires. The Chinese report that these removals were made by the Soviets.

PREPARED BY

Edwin Martin

## HOTEN OXYGEN WORKS

Location: Anshan

Date Visited: 13 June 1946 by Messrs. Elias and Johnston

This plant is a Linde type plant with 2 compressors and fractionation equipment for the production of 400 cylinders of oxygen per day. The nitrogen is not recovered. One compressor needs minor repairs. The plant is complete, there having been no removals. The oxygen produced goes to the iron and steel industry in Anshan for cutting, welding, and deseaming and descaling billets, etc.

The plant is not operating because of lack of power but could be put in operation at once if power were available.

Reduction in capacity is nil.

Number of employees at full operation - 24.

PREPARED BY

N. M. Elias

## MANCHU RUBBER COMPANY, LTD.

**Location:** Liaoyang - near railroad station

**Date Visited:** 10 June 1946 by Messrs. Elias, Einig and Capt. Fenical

The plant is located near the railroad station at Liaoyang. It had been constructed about 1937. The total manufacturing floor space of the plant was 25,000 square meters. The buildings were in very bad shape, most of the roofs gone and only a shell remaining. Removals were extremely thorough and were ordered by the Soviets and carried out by a gang of four to five hundred Japanese laborers over the period extending from October 12 to November 19, 1945. In one building in which rubber shoes and raincoats were made, a fire broke out after the removals.

Products and capacities per day were:

| | |
|---|---|
| Rubber hose | 650 kg/day |
| Flat belting | 100,000 sq. in. ply per day |
| V belting | 10,000 " " " " " |
| Auto Tires for passenger cars and trucks | 140 per day |
| Bicycle tires | 400 " " |
| Tires for horse-wagons | 72 " " |
| Shoes | 12,000 " " |
| Raincoats | 100 " " |

There were 3 small rubber mills and a small laboratory boiler left and about 100 workers were trying to fix up one building for use in producing small necessary rubber articles.

The rubber was imported from Burma and the Malay States, the chemicals for vulcanization from Mukden and Dairen. Mr. Chang and his associates of the Northeast Chinese Economic Commission gave us the information as to equipment originally present. The foundations and general layout peared to confirm his statements as to what had been in the plant.

From the building making rubber hose and belts 4 hydraulic presses, a cutting machine, a large vulcanizing oven and a cylindrical vulcanizer for tubing were removed. Also a winding machine for hose forming, hose testing equipment, motors, belts, etc. Building was about 150' x 150'.

From an adjoining building (about 100' x 100') 5 sets of 20" Rolls and a 300 HP motor had been removed. Another building (3-story, about 180' x 360') 22" calendars had been removed from the ground floor. From the second floor tire forming machines of adjustable size type had been removed and 11 fixed size tire forming machines had been left. A bank of 4 autoclaves 20' high had also been removed. A block of 8 smaller autoclaves for steam vulcanization was left, as were a considerable number of tire molds. From the third floor of this building 12 bicycle tire machines were removed through a hole made in the wall of the building.

The shoe and raincoat building (72,000 square feet) was completely empty, all equipment removed, and fire later damaged the roof.

From the boiler house 2 B&W boilers of 300 square meters and 1 B&W of 400 square meters and one CT type boiler of 68 square meters heating surface were all removed.

Pay of the laborers at this plant under Japanese occupation ranged from 4 to 10 yen per day and they received free housing but bought their food and clothing outside.

Hand operation on tire production using molds left behind might make the production of some tires possible, but capacity for these would not be over 25 per cent. This would necessitate replacement of some boiler capacity and some corollary equipment. Belt, hose, shoes and raincoat production would require complete replacement.

An overall figure of about 5 per cent of previous capacity would be indicated for this plant.

There were no stockpiles of raw materials or finished product. Distribution of product was to the Manchurian market. There is a large present demand for all the products of this plant.

PREPARED BY

N. M. Elias

## LIAOYANG FACTORY OF MANCHU EXPLOSIVES COMPANY, LTD.

(Same as No. 333 Arsenal - branch of No. 918 Arsenal at Mukden)

Location: 8 km east of Liaoyang

Date Visited: 10 June 1946 by Messrs. Elias, Einig and Capt. Fenical.

This plant produced picric acid by two processes. One consisted of nitrating phenol to picric acid. The other started with dinitrochlorobenzol, hydrolyzed this to dinitrophenol with caustic soda and then nitrated the dinitrophenol to picric acid.

In addition the plant also produced trinitrotoluene (TNT).

The plant also made nitric and sulphuric acids, the nitric acid being made by catalytic oxidation of ammonia using a platinum catalyst and the sulphuric acid being made from sulphur dioxide made by burning sulfur by the contact process using a vanadium oxide catalyst.

Capacities:

(a) TNT, two lines in one building each with capacity of 4 MT/day. Total for building 2,400 MT/yr. There were three such buildings making total TNT capacity 7,200 MT/yr.

(b) Picric acid. There was a capacity of 5 MT/day in one building and there were 3 such buildings making total annual capacity of 6,000 MT/yr. One TNT building was 4 years old as was one picric acid building. The other two TNT buildings and the other two picric acid buildings were more modern and only two years old.

The nitrating equipment was very crude consisting of small cylindrical steel tanks lying horizontally, about 4 feet in diameter and 6 feet long provided with cooling coils and with a high speed agitator inserted through a bearing at an angle of about 45°.

The removals were minor, including 8 of the cylindrical nitrators, 4 centrifuges, 3 platinum containing catalytic converters for ammonia oxidation to nitric acid, the vanadium oxide catalyst for sulphuric acid production and the stainless steel gas and acid coolers and 6 acid pumps.

If the acid coolers and pumps and the catalysts are replaced, the capacity of the plant would be about 70 per cent of its previous capacity. However the plant at maximum actually produced a total of only 5,000 tons of picric acid and TNT together, which is less than 50 per cent of rated capacity. The small boiler plant for process steam was not disturbed. There was a so-called molding unit consisting of 6 buildings separated by earth barricades in which there were steam jacketed tilting aluminum crucibles for melting 50 kg TNT and picric acid and casting them. Small wooden boxes were lying about (about 6" cubes) and dome-shaped iron castings with a hole in the dome were also there, some of these made up in a manner to indicate that detonator was placed into the iron castings and these placed in the wooden boxes and explosive material cast around the iron casting, and holes through the wood box for fuses. These were probably a crude type of demolition bomb.

For the construction of the plant 2,000 Japanese and 7,000 Chinese laborers were used.

For its operation there were stated to have been 2,000 Japanese and 2,000 Chinese laborers and 120 office staff. The pay ranged from one and a half to four yen per day, the laborers paying their own rent, food, and receiving one set of working clothes per year.

The ammonia for oxidation came from the synthetic ammonia plant at Dairen. The sulphur for sulphuric acid came from Japan. The product went to the Japanese Army.

PREPARED BY

N. M. Elias

## MANCHU COTTONSEED MANUFACTURING COMPANY

**Location:** Liaoyang - about 1 mile east of railroad station

**Date Visited:** 11 June 1946 by Messrs. Elias, Einig and Capt. Fenical

This plant is not now operating but is in good shape and could readily be put into operation when power is available.

It treats about 600 tons of cottonseed per month obtained from the local cotton for the production of linters, cottonseed oil, soap and press cake used as cattle feed and fertilizer. The cottonseed shell is burned for fuel and potassium carbonate is recovered from the ash.

The removals if any were very minor.

Plant was under construction in 1936 but completed only in 1939.

Oil is extracted by hydraulic pressure leaving appreciable amounts of oil in the press-cake. The purification is apparently not very satisfactory as there is difficulty in selling the oil for food use. The residue from alkali treatment in the purification is converted into a black soap.

There are two small Lancashire boilers for process steam in good condition, heated by cotton shells. Product besides linters are 1.5 MT/day of black soap, 60 MT/month cottonseed oil and 250 T/month of press-cake and 12 T/month of potassium carbonate.

Number of employees were 235 Chinese laborers and 35 Japanese office workers and officials.

PREPARED BY

N. M. Elias

## HULUTAO SMELTER OF MINING CORPORATION OF MANCHURIA
(also known as Manchu Rynan in JANIS)

Location: Hulutao, Liaoning Province, Manchuria

Date Visited: 9 June 1946 by Messrs. Thorne, Martin and Capt. Scott.

Source and Reliability of Information: Information regarding equipment and supply removals was obtained from the following sources:

(a) Northeast Chinese Economic Commission
(b) Report presented by the plant manager. These information sources are fairly reliable and the present status of the plant was confirmed by inspection.

Date Placed in Operation: February 1943

Products: Metallic Zinc and Sulfuric Acid

Production: The Zinc Plant operated only from February to December 1943 producing a total of 85 tons of metallic zinc. The sulfuric acid plant operated to August 1945 producing an average of 1,200 tons per month.

Plant Equipment: The plant was originally constructed in 1939 as a zinc smelter and consisted of roll crushers, 3 Hereshaff roasting furnaces, 1 secondary rotary roasting kiln, a briquetting machine for preparing briquettes of roasted zinc ore and coal, 8 vertical retorts - carborundum lined - for zinc reduction and condensers for metallic zinc. The zinc plant operated from February to December 1943 and produced 85 tons of zinc metal from ore from Yangchiachangtzu. The mining of zinc ore was discontinued as molybdenum ore was discovered in the mine at that time.

The sulfuric acid plant which was constructed to utilize the $SO_2$ from zinc smelting was put into operation using iron pyrites as a source of sulfur.

The sulfuric acid plant is of the contact type and has a capacity of 50 tons of acid per day. Plans had been made to increase the capacity of the plant to 100 tons and much of the equipment is on hand to meet this expansion of capacity including blowers, purification system and building capacity.

The sulfuric acid equipment includes the following major items:

3 - Hereshaff roasting furnaces
4 - Sulfur dioxide washing towers
4 - Dust collecting Cottrell precipitation units
2 - Gas drying towers
2 - 100 HP electric driven blowers
1 - Catalyzer chamber
    Heat exchangers, Gas coolers
2 - Sulfuric acid absorbers
3 - 300-ton storage tanks

Removal of Equipment: Only a small quantity of equipment was removed from the plant—this equipment being primarily part of the control instruments, miscellaneous supplies and belting. There appears to be a sufficient quantity of salvageable equipment of this type on hand to start operations if desired.

According to the plant manager this material was removed by the Soviet army during its occupation of the area from September 8 to November 10, 1945. The plant is in a rural area about 3 miles from Hulutao and there was little evidence of pilfering.

Source of Raw Materials and Power:

Iron pyrite ore from Japan - none on hand.
Coal from Fouhsin mine - none on hand.
Zinc from mine located at Yangchiachangtzu.
Electric power from outside source - not now available.
Heat for the plant is provided by 3 gas producers charging Fouhsin coal.

Former Distribution of Product: The output of the sulfuric acid plant was shipped to Mukden to be utilized by the Metal Refinery there. Fourteen stockpiles: approximately 600 tons of 100 per cent sulfuric acid are in storage at present.

Immediate Future Demand for Product: There is now a definite need for sulfuric acid. The sulfuric acid plant is in very good condition, the equipment is new and has been well installed and maintained. It could be put into operation on short notice except no source of sulfur is available at present. The location of the plant near the port of Hulutao seems desirable as sulfur may be shipped in by water. The disposition of the plant largely will depend upon the availability of raw materials principally sulfur. Obtaining an adequate supply of labor in this thinly populated area may present a problem.

Present Plant Manager: The plant is under the custody of the Northeast Chinese Economic Commission.

Process: The sulfuric acid plant is of the contact type and has at present an operating capacity of 50 tons of 100 per cent acid per day. The plan of operation appeared to be normal operating procedure for this type of plant. Sulfur dioxide is generated from iron pyrites ore in the Hereshaff furnaces. Dust is removed from the gas in a series of washers and precipitators. The purified gas, sulfur dioxide, is oxidized in the catalyzer to sulfur trioxide, which in turn is absorbed in concentrated sulfuric acid to form oleum of 10 to 20 per cent sulfur trioxide. The oleum is diluted to 100 per cent acid and stored.

Remarks: The sulfuric acid plant has not operated since August 1945. Prior to that date it produced acid at the rate of 1,200 tons per month.

The zinc plant has not operated since December 1943 because of loss of production at the mine. The zinc ore deposit at the Yangchiachangtzu mine was becoming depleted when a molybdenum bearing ore was discovered in the mine. The zinc deposit was abandoned in favor of the molybdenum. The plant now has no source of zinc ore and in addition the continuous reduction furnaces were poorly constructed so that the carborundum brick linings cracked during heating allowing air to enter the furnaces in the reduction zone causing losses of zinc as the oxide and other poor operating conditions. During its entire operating life (February to December 1943) the plant produced only 85 tons of zinc metal.

PREPARED BY

H. M. Thorne

## MANCHURIAN GAS COMPANY (CHANGCHUN WORKS)

**Location:** Changchun, Kirin Province, Manchuria

**Date Visited:** 20 June 1946 by Messrs. Taylor and Thorne

**Source and Reliability of Information:** A former Japanese engineer of the Manchurian Gas Company (Kirin, Mukden, Anshan, Changchun, Harbin, Antung and Dairen). In Source File 8-C-2 there is the plant layout, production data, product distribution and equipment removal information which was prepared and presented by the former Japanese engineer. A check of equipment removals and damage, by the visit to the plant, proved this list of missing and damaged equipment to be correct. The dates of Soviet occupation and plan of removals agree with similar information gathered from various other sources.

**Date Put into Operation:** 1935

**Description of Product:** Artificial gas for commercial and domestic use. By-products such as coke and coal tar.

**Annual Capacity:** Annual gas producing capacity prior to August 1945 was about 12½ million cubic meters. Coke production amounted to 29,200 metric tons and coal tar, 1,600 tons.

**Plant Equipment:** Coal unloading, conveying and charging equipment.

5 - Retort houses containing 306 horizontal producer retorts.
2 - "Apparatus" houses containing coolers exhaust fans and compressors.
1 - Gas washing and desulfurizing equipment.
1 - Compressor equipment for pipeline distribution.
1 - Equipment for recovering ammonia and ammonium sulfate from the gas liquor.
2 - Gas holders 10,000 cubic meters capacity.
1 - Office building.
1 - Boiler house.
1 - Machine shop.
3 - Warehouses.
5 - Miscellaneous small buildings.

**Number of Employees:** 220 Japanese; 670 Chinese.

**Removals and Damage Dates:** The Japanese remained in possession and operated the plant until September 12, 1945, at which time the local police (Chinese) took charge of the plant for the municipal government. The Soviet Army moved into Changchun on August 20 and took charge of the plant. During the Soviet occupation from August 20 to December 1945, they removed automobiles, trucks, furniture, machine tools, some electric motors, rubber and leather belting. The Soviets continued occupation until April 14, 1946 when the government of the city was taken over by the Chinese Central Government. The Central Government was forced out on April 17 by Chinese Communist troops who occupied the city until May 23, 1946. The Nationalist Army regained control of the area on that date.

During the latter part of the Soviet occupation and since no one had been in charge or entirely responsible for this plant, consequently, considerable looting of small equipment including electric motors, panel boards, gauges and some belting has occurred. Also a small amount of destruction by looters and others has resulted in damage to some remaining equipment. Freezing of the water jacket of one compressor damaged the jacket. (See Source File 8-C-2 for specific removals and damage.)

Maximum Capacity Considered Practical to Restore: Thirty per cent of the former capacity of the plant may be restored with little expense or need for new equipment. Inasmuch as the industries in Changchun are not and will not be operating to any great extent for some time, the thirty per cent of former capacity will be sufficient to supply domestic needs including hospitals and laboratories.

The Japanese engineer estimates the plant can be put into operation at thirty per cent capacity within four months at an estimated cost of 4 million yen.

Source of Raw Material:

(a) Previous: Coal from Fushun, Peipiao and other sources

(b) Future: Probably same source

Stockpiles:

(a) Raw Materials: Coal - none

(b) Finished Products: Coal tar - 55 tons
Coke - none

Former Distribution of Products: Local

Immediate Future Demands for Products: The city of Changchun has now no gas supply for public or private building.

Name of Former Plant Manager: Mr. Kawakara (died February 19, 1946 of natural causes) former plant manager.

Name of Present Plant Manager: The Northeast Chinese Economic Commission has requested the Chinese Central Government to appoint or designate a manager of this plant.

Name of Soviet Officials Handling Removals: General Marinoffsky (?)

Notes on Process: Coal of one inch and smaller is charged by an electric operated blower as charging apparatus to each horizontal retort. (Each retort is approximately 5" x 24" x 15'). Hot gases and steam are passed through the walls of each retort for 10 hours heating the retort and coal to gasification temperature. The resulting gas is washed with a water spray, tars are condensed and the dry gas is heated with iron oxide catalyst to remove sulfur compounds. The purified gas is stored in gasometers for transmission to users. A mechanical arm pushes the coke from each retort into cars. The coke is utilized by industry for forging, making of castings and for domestic heating. Coal tar is sold for refining to yield various coal tar products to be used largely in the chemical industry.

Remarks: The equipment in this plant is antiquated and should be replaced by modern equipment when available.

PREPARED BY

H. M. Thorne

Appendix 10 Plant Inspection Report 9-C-1

# MANCHURIA ELECTRO-CHEMICAL INDUSTRIAL COMPANY, LTD.

**Location:** Kirin, Kirin Province

**Date Visited:** 1 July 1946 by John P. Hurndall

**Source and Reliability of Information:** Information was obtained from former Japanese plant manager, who is considered reliable and information considered true.

**Date Placed in Operation:** (a) Minor Carbide Plant - May 1942
(b) Phosphorus Plant - June 1945

**Description of Products:**

(a) Calcium carbide (principal are acetylene gas, calcium cyanimide, organic synthesis of acetylene series).
(b) Phosphorus sulphide
(c) Coke
(d) Calcium cyanamide
(e) Butanol

**Capacity as of 15 August 1945:**

| | | | |
|---|---|---|---|
| (a) | Minor Carbide Factory | 15,000 | t/yr. |
| (b) | Phosphorus sulphide | 80 | " |
| (c) | Coke - 1st battery | 150,000 | " |
| | 2nd " | 150,000 | " |
| (d) | Major Carbide Factory (designed) | 66,000 | " |
| (e) | Calcium cyanamide | 30,000 | " |
| (f) | Butanol | 4,000 | " |

**Number of Employees:**

| | | | |
|---|---|---|---|
| (a) | Minor Carbide Plant | 400 | men |
| (b) | Phosphorus sulphide plant | 150 | " |
| (c) | Employees engaged in construction | 5,000 | " |

**Removals:** (a) Minor Carbide Plant: All equipment except electro furnace shell and electrode brackets, including all transformers and electrical fittings removed. Hoppers and lime kilns intact but grinding equipment removed.

(b) Major Carbide Plant: All electrical and auxiliary machines less furnace removed.

(c) Coke Plant: Coke ovens remain but all auxiliary equipment and fittings removed.

Removal dates—September 25 to October 18, 1945. It appears from inspection that all the essential equipment of this plant except large parts fabricated out of steel plate and brick have been removed. See Source File No. 9-C-1 for detailed description and value.

Previous Source of Raw Materials:

(a) Coking coal: Honchiang Coal Mine 400 km east of Kirin—output of mine was 300,000 t/yr.
(b) Limestone: Nungchang in Kirin district (120 km South)
(c) Anthracite: N. China and Korea
(d) Apatite: Santong, China
(e) Animal Bone: Manchuria
(f) Sulphur: Japan

Stockpile on Hand:

| | | | |
|---|---|---|---|
| (a) | Raw Materials — | Limestone | 3,000 tons |
| | | Apatite | 800 " |
| | | Anthracite | 1,000 " |
| | | Coking Coal | 3,000 " |
| (b) | Finished Products — | Carbide | 3 " |
| | | Phosphorus sulphate | 1 " |

Former Distribution of Product:

(a) Carbide. Manchuria. Demand was about 20,000 tons in 1944.
(b) Phosphorus Sulphide. Manchuria. For manufacturing matches. Demand was about 80 tons in 1944.

Name of Present Plant Custodian: Mr. Wang-ka-lin.

Names of Soviet Officials Handling Removals: Major Sherishefsky
Major Diement

Notes on Process:

(a) Carbide: $CaCO_3$ plus C equals CaO plus $CO_2$

CaO plus 3C " $CaC_2$ " CO

(b) Phosphorus Sulphide:
$Ca_3(PO_4)_2$ plus $3SiO_2$ equals 3 $CaSiO_3$ plus $P_2O_5$

$P_2O_5$ plus 5C equals 2P plus 500

4 P plus 3S equals $P_4S_3$

Remarks: Source File 9-C-1 contains a full account of the chronological events concerning removals. In short they were accomplished by Soviet direction using Japanese and Chinese labor and Japanese technical assistance. The file also contains detailed information concerning founding of the company, capital investment, and operation.

PREPARED BY

J. P. Hurndall

# MANCHURIA SYNTHETIC RUBBER COMPANY, LTD.

**Location:** Lungtan Street, Kirin, Kirin Province

**Date Visited:** 2 July 1946, by John P. Hurndall

**Source and Reliability of Information:** Dr. C. C. Shao, members of the Northeast Chinese Economic Commission and the former Japanese plant engineer furnished information on the plant. Data are regarded as reliable. Removals were confirmed by observation.

**Date Placed in Operation:** Test run in September 1944. Never placed in full operation.

**Description of Product:** Neoprene system synthetic rubber.

**Capacity as of August 15, 1945:** 300 tons per annum.

**Plant Equipment:**
(a) $C_2H_2$ gas generating equipment
(b) Mono-vinyl acetylene reaction equipment
(c) Chloroprene reaction equipment
(d) Catalyst preparing equipment
(e) Distillation equipment
(f) Polymerization equipment
(g) Roll equipment
(h) HCL generating equipment
(i) Boiler house
(j) Repair shop
(k) Office, storehouse, etc.
(l) Refrigerating equipment

**Number of Employees:** 350 at full operation

**Removals:** All the plant equipment with the exception of a few welded steel tanks; two furnaces in the HCL generating house and two small furnaces in the repair shop were removed by the Soviets between October 1st and October 18th, 1945. The plant can be regarded as completely stripped with 100 per cent loss of capacity and equipment. For details, see Source File 9-C-2.

**Destruction:** No destruction other than by Soviet removals.

**Comments on Restoration:** Because of the completeness with which the plant was stripped, restoration will involve completely reequipping, salvaging only the buildings.

Previous Source of Raw Materials:

(a) Calcium carbide - from Manchu Electro-Chemical Company, now stripped.

(b) $H_2SO_4$ (for HCL making). The Nichimar Shaji Company.

(c) Raw salts - The Nichimar Shaji Company.

Stockpiles: None

Name of Present Plant Custodian: Mr. Wang-ka-lin, of the Northeast Chinese Economic Commission.

Names of Soviet Officials Handling Removals: Major Sherishetsky
Major Diement

Notes on Process: See Source File 9-C-2 for flow sheet.

PREPARED BY

J. P. Hurndall

## KIRIN MATCH COMPANY, LTD.

**Location:** Kirin, Kirin Province

**Date Visited:** 1 July 1946 by John P. Hurndall

**Source and Reliability of Information:** Additional information from the former Japanese plant manager is considered reliable.

**Date Placed in Operation:** 1919 (?)

**Description of Product:** Matches, splints, lumber

**Capacity as of August 15, 1945:**

32,600 cases matches per year
61,900 cases splints per year
6,000 cubic meters lumber
(NOTE: 1 case contains 2,400 boxes)

**Plant Equipment as of August 15, 1945:** Not inventoried but consist of lumber cutting and splitting equipment, handling equipment, mixing and drying equipment.

**Removals:** Plant left intact except for 2 Swedish designed match chipping machines (20 years old and claimed to be the only ones in Eastern Asia) which were removed by the Soviets. There were also 100 cubic meters of logs and 3,133 cases of matches taken by the Soviets.

**Comments on Restoration:** Due to the loss of the chipping machines the plant is completely out of operation. With the restoration of this item of equipment the plant could operate, provided a new source of phosphorus is obtained. Previously the plant obtained phosphorus sulphide from the Manchuria Electro Chemical Company at Kirin, the equipment of which plant has been removed by the Soviets.

**Previous Source of Raw Materials:**

(a) Potassium chlorate - ?
(b) Phosphorus sulphide - Electro Chemical Company, Kirin
(c) Sulphur - Japan
(d) Lumber - locally

**Former Distribution of Product:** Manchuria

PREPARED BY

J. P. Hurndall

## CHINESE CHANGCHUN RAILWAY CORPORATION ALCOHOL PLANT

Location: Harbin, Kirin Province, Manchuria

Date Visited: 28 June 1946 by Mr. H. M. Thorne and Capt. Earl Scott

Source and Reliability of Information: Soviet plant manager. Information appears reliable.

Date Put into Operation: Prior to 1932

Product: 95 per cent ethyl alcohol

Capacity: 12,000 liters per day

Equipment: Grinding equipment for grain, mixing tanks, fermentator tanks, settling and filtering equipment, distillation towers, steam boilers and packaging equipment.

Number of Employees: 200 (present)

Source of Raw Materials: Grain purchased locally

Stockpiles: Some grain - exact quantity not divulged. Small quantity of coal.

Distribution of Product: Most of the alcohol was taken by Changchun Railway Company. Surpluses are sold chiefly for the manufacture of vodka locally.

Former Manager: Prior to 1935 cooperatively owned by Chinese Eastern Railway Company. Manager 1935 to August 1945 was Mr. Ma (Chinese).

Present Manager: Soviet (name not obtained)

Process: Corn, 8 parts - wheat, 1 part - barley, 1 part are ground mixed and fermented. The fermented mash is then settled, filtered and distilled to 95 per cent alcohol.

Remarks: Japanese started building an extension to the plant but it was never completed. The construction project is now dormant. It was stated that the new extension was to produce vodka and would about double the plant's alcohol capacity.

The present production of the plant is limited to 2,500 liters per day by the lack of fuel.

PREPARED BY

H. M. Thorne

# HARBIN OXYGEN FACTORY

**Location:** Harbin, Kirin Province, Manchuria

**Date Visited:** 1 July 1946 by Messrs. Thorne and Taylor

**Source and Reliability of Information:** Information on the plant was obtained from the Municipal Government of Harbin. The reliability of the source cannot be judged; however, the status of the equipment was verified by inspection.

**Date Put in Operation:** 1937

**Product:** Oxygen in cylinders

**Capacity:** 300 cylinders per day — 7,000 liters per cylinder

**Plant Equipment:**
3 - 3-stage air compressors
3 - Coolers for compressed air
3 - Separators for liquid air
3 - Liquid air pumps
3 - Manifold line units for filling cylinders

**Number of Employees:** 23 at present

**Raw Materials:** Small quantity of caustic soda purchased locally.

**Distribution of Product:** Locally

**Demand:** Large demand for use in welding for repair and construction work.

**Former Plant Manager:** Owned by Japanese individual - name not known.

**Present Plant Manager:** Operated by local municipal government - manager's name not known.

**Notes on Process:** Air is liquified by alternate compression and cooling in 3 stages. Nitrogen is separated from the oxygen in a Linde fractionating tower. The nitrogen is blown to the air. The oxygen is collected in a gasometer and pumped into cylinders at 200 kg per square centimeter pressure.

PREPARED BY

H. M. Thorne

# KANGTEH FLOUR MILL

**Location:** Ssupingchieh

**Date Visited:** 17 June 1946 by Mr. Cleaveland and Capt. Scott

This mill was built by the Japanese in 1937 and had a capacity of 4,000 bags (22 kilo each) of flour per day. It was reported that the entire product of this mill went to the Japanese Army. Very large warehouses adjoin this mill for storage of both grain and flour. It was reported that the Soviets removed 586,000 sacks of flour from these warehouses.

The unique thing about this mill was the fact that it was almost intact with practically no damage by looters. All belting had been removed and some tools from the repair shop, including a radial drill. The Soviets were reported as taking the grain grinding machines also. The horizontal sifters had been damaged somewhat, apparently by persons seeking the sifting screens.

Electrical installations remained intact including a 350 HP motor and a 150 HP motor which supplied the power for the mill. I was told by the present Chinese manager of the plant that if the belting was replaced together with the grinders, and if the sifters were repaired, that the mill could quickly resume normal production.

This mill had been occupied for nearly two months by the Chinese Communists who had strongly fortified it with machine gun nests on the roof and trenches in the yard.

An interesting question arises as to why looters were kept out of this plant by both the Soviets and the Chinese Communists while it was reported they were being encouraged to run wild elsewhere. There was another flour mill in the same neighborhood, called the East Asia Flour Mill which was reported to be in a similar state of good repair. On the other hand, there was the East Asia Grain Mill which we visited that had practically all its machinery removed and the premises thoroughly looted. This mill prepared millet and Kaoliang for Chinese consumption. Kaoliang appeared to be a sort of Kaffir Corn of Milo Maize.

PREPARED BY

Norman Cleaveland

# SUPPLEMENT TO PLANT INSPECTION REPORT 19-J-1

Approximately a week after our return from Ssupingchieh I became involved in a discussion with a group of war correspondents who were familiar with conditions at Ssupingchieh and raised the question as to why the flour mills had obviously been protected from looting and equipment removals by both Soviet and Chinese Communist armies. Several of the reporters stated that they had noticed the same condition and were puzzled by it. One reporter, whose name I do not recall, stated that he had picked up the following explanation from a native Chinese in Ssupingchieh.

When the Soviets arrived in Ssupingchieh they took charge of the flour mill and the adjoining warehouses, which had over 500,000 sacks of flour. The Soviet Commander is reported to have told the leader of the local Communist forces that the flour mills were considered to be essential for an agrarian economy and therefore the Soviets would turn these mills and warehouses over to the Communists for the use of the people. Shortly thereafter the Soviet Commander was reported to have informed the Chinese Communists that if they had more flour than they needed that the Soviets would be willing to trade captured Japanese arms and ammunition for flour. This deal was concluded and the Soviets took all the flour and turned over to the local Communists large stores of captured Japanese arms. In other words, flour from the Ssupingchieh mills was used as a subterfuge for arming local Communist forces.

However, this explanation does not cover the grain mill, for the machinery had been removed from it and the premises thoroughly looted.

PREPARED BY

Norman Cleaveland

## MANCHU SODA MANUFACTURING COMPANY

Location: Kaiyuan, Liaoning Province, Manchuria

Date Visited: 15 June 1946 by Messrs. Thorne and Cleaveland

Source and Reliability of Information: Information regarding the plant was obtained from the interview on 15 June 1946 with Mr. King, Secretary, Chamber of Commerce, Kaiyuan. The chronology of Soviet occupation seems reliable and his reports of removals and destruction were confirmed by the inspection of the plant.

Date Put into Operation: 1940

Description of Product: Caustic soda, chlorine, hydrochloric acid, bleaching powder, and an unknown chlorinated coal tar product or products, probably monochlorbenzol.

Capacity: Caustic soda - 2,000 tons per year
Hydrochloric acid - 2,000 tons per year

Plant Equipment:

| | |
|---|---|
| 6 | Brine solution tanks |
| 2 | AC - DC generator sets with panels and controls |
| 48 | Electrolytic cells (6' x 40' approximately - each), mercury type |
| 2 | Compressors (for filling cylinders; capacity, 60-70 cylinders per day) |
| 50 | Iron cell tanks in storage |
| 1 | Plant for chlorinating coal tar products |
| | 12 shell stills and towers |
| | 4 chlorine compressors |
| | 4 product washing tanks |
| 1 | Gas holder (approx. 6,000 cubic feet capacity) |
| 3 | Hydrochloric acid reactor towers |
| 3 | Condensor and absorption towers |
| 4 | Large vertical compressors for chlorine |
| 6 | Chlorine purification towers |
| 3 | Rotary circulation pumps |
| 1 | Bleaching powder plant (number of units not determinable as plant completely destroyed) |

Buildings: Approximately 15 brick buildings with tile roofs, including warehouses. The 2 buildings housing the electrolytic cells and the bleaching powder equipment were completely demolished. The remainder of the buildings were damaged but can be repaired.

Number of Employees at Full Operation: 150 Japanese; 150 Chinese

Removals and Destruction:

(a) Soviet: The Soviet Army arrived September 11, 1945 in Kaiyuan and started dismantling the soda plant on September 28th. After completing the dismantling, about November 15, they left Kaiyuan March 11, 1946. The Magistrate did not know the name of the Soviet unit. Some Soviets were in uniform, some were in civilian clothes.

The Soviets removed all electric motors, two electric generators - total 3,500 kw capacity, all babbitt from bearings and 29 tons of mercury from the electrolytic cells.

(b) Chinese Communists: The Communists arrived at Kaiyuan on September 25, 1945 and remained until forced out by the Nationalists on May 19, 1946. The Communists were largely responsible for wrecking the building, scattering stocks, breaking control instruments, taking all rubber belting, and damaging much of the remaining equipment including the electrolytic cells and bleaching powder plant.

(c) Chinese Residents: The local populace looted the plant of small equipment such as plumbing fixtures, electric switches and wiring, window frames, wood from buildings and roofs, and such stocks of products that remained. There was no looting of the plant or Japanese homes by the Chinese before the Soviets came.

Maximum Capacity Considered Practicable to Restore: The restoration of any capacity would require practically rebuilding the plant. Although some undamaged equipment remains, it is antiquated and not sufficient to be used as a nucleus for a plant. Most of the buildings could be repaired.

Source of Raw Material:

(a) Previous: Salt from Dairen; power from coal-fired power plant serving the caustic soda plant and the paper and pulp plant just across the railroad tracks from this plant. Some additional power was received from the integrated transmission lines.

(b) Future: Probably same source if available.

Stockpiles: Raw materials - none; finished products - none.

Former Distribution of Products: Most of the caustic soda to paper and pulp plant nearby and part to the glass factory at Dairen.

Immediate Future Demands for Product: Caustic soda is needed in a large number of industries but only one soda plant capable of production remains in Manchuria (Mukden).

Notes on Process: The plant appears to be of the conventional mercury electrode type for the electrolysis of salt to produce caustic soda and chlorine. Part of the chlorine is hydrogenated to hydrochloric acid and part used to chlorinate lime to bleaching powder. One portion of the plant of which no one had any knowledge of the process was apparently devoted to chlorinating coal tar products - the odor and some crystals of napthalene were evident. A guard who had worked in the plant thought this part had something to do with "benzene". The compressors, still, and towers indicated chlorination of a liquid coal tar material - no products could be found.

Remarks: Mr. Liu, member of the Northeast Chinese Economic Commission who conducted us through the plant, knew nothing regarding the plant or the history of plant damage or removals. The present Magistrate of Kaiyuan had been in town only 3 months so knew little of the history. Mr. King, Secretary of the Chamber of Commerce, gave us the history of the occupation but knew little of the plant processing. A Japanese laborer who had worked in the plant conducted us through the plant but knew nothing of the processes involved. Mr. King reported that some Japanese staff members were taken by the Soviets. The remainder have all been repatriated. About 30 Japanese coolies are still in Kaiyuan. The former Japanese manager is in Mukden.

Mr. King reported that the Soviets started immediately to ransack Japanese homes, taking most of their personal goods of value. They also ransacked some Chinese homes. The Soviet soldiers then led the Chinese coolies to the Japanese homes urging them to further pillage the Japanese.

Some pumps and other equipment were pried loose from their bases and dumped on the floor. Warehouse stocks were scattered all over the plant yard.

PREPARED BY

H. M. Thorne

## MANCHURIA ASANO CEMENT COMPANY, LTD.

**Location:** Fushun

**Date Visited:** 3 June 1946

This cement plant has two kilns with a total capacity of about 200,000 metric tons of cement per year. One uses the dry process and the other the wet process. The principal raw materials are limestone, about 65 percent from deposit near Dairen; coal, about 15 percent from Fushun mines; gypsum, about 10 percent from Shensi Province in North China; and spent shale, about 10 percent from the adjoining shale oil plant.

It has not operated since August 1945. Resumption of operations is not possible, according to the Japanese manager, until power and coal are available, and more skilled labor to carry out repairs can be secured. Even the joint stockpiles of limestone and gypsum will not last long without replenishment. Given favorable conditions it will turn out cement in 20 days according to the Japanese manager.

None of the productive equipment has been damaged or removed. Soviet removals, according to the detailed list prepared by the Chinese, were confined to office supplies and equipment, testing equipment, automotive vehicles, considerable numbers of bags, and some cement.

PREPARED BY

E. M. Martin

# ONODA CEMENT COMPANY

Location: Anshan

Date Visited: 13 June 1946 by Messrs. Elias and Johnston

This plant makes cement from clinker from the Hsiaotung Cement Works adding gypsum and slag in the following proportions:

| Clinker | Gypsum | Slag |
|---|---|---|
| 57 | 3 | 40 |

The slag is produced from the blast furnaces of the Manchu Iron Works and is a granulated slag. Coal is mined at Fushun and Bujun.

Capacity is 7,000 tons per month. Requires 400 tons coal per month for this production.

All equipment is usable. Only motors up to 10 HP were reported removed. A small repair shop containing a few machine tools was intact. Transformers intact.

This plant was not operating because of lack of power. It could be put in operation almost immediately if power were available.

Plant built in 1934. The chief repair necessary would be replacement of a few small motors and rebuilding of storehouses which were reported burned down by mobs.

The plant had 129 workers, and one technician and an assistant.

Area of site - 110,000 square meters.

Area of buildings - 5,100 square meters.

Decrease in capacity negligible.

PREPARED BY

N. M. Elias

## IWAKI CEMENT COMPANY - KUNGYUAN WORKS

Location: Kungyuan (about 1 mile west of town and across river from Penchihu--41° 20' N - 123° 45'E).

Source and Reliability of Information:

(a) Actual inspection of the properties on 10 June 1946 by Messrs. Taylor and Hurndall.
(b) Former Japanese director of the Manchu Steel Works, Penchihu, and former Japanese employees of the cement plant along with Northeast Chinese Economic Commission members. These latter sources were fairly reliable and their information accepted as true.

Product: Portland Cement bagged and in bulk.

Capacity: 200,000 tons per year is about rated capacity.

Plant Equipment: This is typical dry process Portland cement plant with all necessary equipment to produce the finished product from unprocessed raw materials. Following is a list of the more important units but is not a complete inventory:

(a) Rock Crushers (primary) about 800 tons per day located at quarry.
(b) Overhead belt conveyor about 1,000 feet long from quarry to plant (about 800 tons per day capacity).
(c) 2 high speed overhead traveling cranes - 50-foot span for handling clinker with clam shell buckets.
(d) 2 kilns 70 meters long x 3.4 meters diameter.
(e) 8 ball reduction mills.
(f) Coal pulverization plant.
(g) Bagging machines - 4.
(h) 6 - 2,000-ton storage tanks.
(i) 7500 KW steam turbine generator and 2 waste heat boilers providing electric power for plant.

Removals: With the exception of the above listed 2 kilns, 3 of the ball reduction mills and 2 of the bagging machines, this plant was completely stripped of all mechanical and electrical equipment. Of the equipment left (kilns, ball mills etc.) many of the essential parts such as the drive mechanism for the kilns and ball mills had been removed. Also, the fans, dryers and preparation equipment (see "Remarks" for responsibility).

Destruction: Of the non-mechanical and electrical equipment such as storage tanks, bins, and buildings about 50 per cent had been destroyed (see "Remarks" for responsibility).

**Capacity Considered Practical to Restore:** It is not considered practical to restore this plant as the removals and destruction have been so complete that it would be necessary to rebuild the plant almost completely. In addition, there is another cement plant within this area (Penchihu) that has not been so extensively damaged that will be much easier to start operating again.

**Source of Raw Materials:** Limestone—adjacent quarry 1,000 feet away
Clay—adjacent pit 1,000 feet away
Coal—Fouhsin

**Stockpiles:** (a) There are no stockpiles of raw materials but adjacent quarries are available. (b) No stockpile of finished cement.

**Former Distribution of Product:** No definite information but from the construction that was going on in this area prior to the war's end, it can be assumed that practically all cement produced was used locally (Penchihu and Kungyuan).

**Future Demand for Cement:** There will be a good demand for cement in this area for reconstruction of damaged equipment and new construction of roads and bridges.

**Notes on Processes:** Nothing particularly outstanding in this standard process. However, the kilns have a good method of unloading the finished clinker. There are a number of small drums about 3 feet in diameter and 15 feet long fastened on the outside and around the circumference of the lower end of the kilns. The finished clinker goes into these cooling drums from the discharge end at the kiln and passes through them by means of a corkscrew baffle.

**Remarks:** This was one of the most complete removal jobs observed. Railroad tracks had been laid in the center of the plant to facilitate loading of equipment on cars. Many parts of the buildings had been destroyed for the purpose of removing the machinery. We were told by the Chinese and Japanese sources that all of this had been done by the Soviets. This explanation seemed very logical and correct in the light of subsequent inspections of other plants in this vicinity.

PREPARED BY

N. M. Taylor

# IWAKI CEMENT COMPANY - PENCHIHU WORKS

Location: Penchihu (41° 20'N. - 123° 45'E)

Source and Reliability of Information:

(a) Actual inspection of the properties on 10 June 1946 by Messrs. Taylor and Hurndall.

(b) Former Japanese director of the Manchu Steel Works, Penchihu, and former Japanese employees of the cement plant along with Northeast Chinese Economic Commission members. These latter sources were fairly reliable and their information accepted as true.

Product: Portland Cement and Slag Cement both bagged and in bulk

Capacity: 200,000 tons/year - Portland Cement
50,000 " " - Slag Cement

Plant Equipment: This is a typical dry process cement plant with all necessary equipment to produce the finished product from unprocessed raw materials. There were two rotary kilns each about 70 meters long and 3.4 meters in diameter. Two waste heat boilers supplied steam to two 4000 KW steam turbine generators. Limestone rock was brought in on a cable tramway 2 km. long.

Removals: Two 4000 KW steam turbine generators together with about 25 per cent of the electric control equipment were removed. The Chinese and former Japanese plant manager stated this was done by the Soviets. From observed evidence, this appeared to be true as the method used followed the familiar pattern. These generators supplied electric power for the plant. There were no other major removals.

Destruction: There appeared to be very little destruction.

It was stated by the Chinese that when electric power is available to run the plant it can produce about 200,000 tons per year. This is probably high.

There is very little major equipment needed to restore this plant to operation with the exception of the electric generators. However, outside power could be used if available. It will take (we were told by the Chinese) from 3 to 4 months to make necessary repairs on the plant before operating, as the machinery in many cases is badly worn. This was caused by excessive operation during the last months of the war.

Source of Raw Materials: (a) Previous—Material for 200,000 tons per year of Portland cement secured mainly from quarries. Material for 50,000 tons per year of slag cement secured from Manchu Iron Works, Penchihu and Kungyuan blast furnaces. (b) Future—Quarries remain available. Supply of slag doubtful for some time but will be obtainable if blast furnaces operate again. Previous and future coal from Penchihu Coal Mine.

Stockpiles: There was a small amount of clinker on hand ready for grinding but no finished cement.

Former Distribution of Product: No definite information available but probably used locally for construction in new town of Kungyuan and local industry.

Immediate Future Demands of Product: All cement that can be produced by this plant can be used locally for construction and repair.

Remarks: We were told that as of August 1945 the condition of the machinery in this plant was not as good as that in the Kungyuan plant across the river and that was the reason advanced for the Soviets not stripping this plant in the same manner as they did at Kungyuan.

The Chinese plan to operate this plant as soon as power is available and a few repairs and replacements can be made.

PREPARED BY

N. M. Taylor

## MANCHU IWAKI CEMENT PLANT

Location: Liaoyang - south of railroad station - about 4 km.

Date Visited: 9 June 1946 by Messrs. Elias, Einig and Captain Fenical.

This plant is now not in operation because of lack of coal and power to start it though when operating it recovers almost enough power from the waste heat of the kilns for full operation. The raw material used is a mixture of limestone and clay with small additional amounts of iron ore and gypsum. The limestone and clay come to the plant on cable trams from quarries and pits 1 to 3 miles away. The limestone is burned and the clay dried in kilns and the two mixed, ground further and then charged into the cement kilns. There are two cement kilns one 3.3 x 70 m. and one 3.0 x 50 m. The clinker is further mixed with gypsum and iron slag, ground and bagged. The ratio of ingredients were stated to be:

500 Clay : 1800 Limestone : 30 Gypsum : 20 Iron Slag

The gypsum is obtained from Shansi province and the iron slag from Penchihu. Power needed is obtained partly from hydroelectric grid. Plant consumption at maximum is 4000 kw. Most of this is obtained from 2 turbo-generator sets (Metropolitan Vickers) one of which is out of order due to lack of a reduction gear. These sets have a capacity of 2200 kva each, Power Factor 1, 3 phase, 50 cycles, 3300 volts, 1000 RPM, 385 amperes.

The two waste heat boilers use an induced draft and take the heat from the combustion gases of the kilns. The boilers are water tube boilers with 100 tubes 4" dia., 22' long. Heating surface stated to be 978 square meters, operating steam pressure 265 pounds/square inch.

The fuel for the plant is powdered coal and ball mills are installed to dry and powder the coal. The coal comes from Fushun and Fouhsin. Coal consumption is 80 tons/day.

There are 700 laborers when running full and 60 of these were Japanese. Pay is 3 Japanese yen per day. Rice at 0.4 yen per kilo and one-half kilo allowed per day. Rent free. Clothing had to be bought by workers.

Plant built in 1934.

The turbo-generator sets at this plant are to be set in operation to provide power for operating the Manchu Cotton Spinning and Dyeing Company Plant. On June 14th repairs had been made and tests were to be run the following day as stated to us by Mr. Chang while we were returning to Mukden.

No removals of any importance.

PREPARED BY

N. M. Elias

## MANCHURIAN ONODA CEMENT COMPANY

Location: Hsiaotung (about 123° 15'E 41° 15'N) on railroad between Penchihu and Liaoyang and east of Liaoyang about 10 miles.

Source and Reliability of Information:

(a) Actual inspection of plant 11 June 1946 by Messrs. Taylor, Hurndall, Shaner and Johnston.
(b) Former Japanese plant manager who was fairly reliable and his information accepted as true.
(c) Chinese Northeast Economic Commission, who are fairly reliable and their information accepted as true.

Date Put in Operation: 1941

Description of Product: (a) Portland cement and (b) clinker which was sent to Anshan for mixing with blast furnace slag and grinding.

Production: Rated capacity was (a) 50,000 tons of cement per year, (b) 100,000 tons of clinker per year. However, actual total production was about 110,000 tons per year of both cement and clinker.

Plant Equipment: This is a typical small cement plant using the half wet process. The principal items of equipment as of 1 October 1945 are as follows:

(a) 2 hammer crushers for limestone
(b) Rod mill for limestone
(c) Kiln
(d) 1 14-meter long ball mill for cement
(e) 1 24-meter long ball mill for cement
(f) 2 sacking machines (2 spares)
(g) 2 overhead cranes
(h) Necessary electrical equipment
(i) Usual plant maintenance machine and tool shops.

Employees When Fully Operating: 750

Removals by the Soviet Army:

(a) 4 transformers (about 500 KVA each)
(b) 3 lathes and controls, 1 shaper, and 1 boring machine from machine shop
(c) 1 air hammer

NOTE: Removals took place in October-November 1945.

Destruction: None to speak of.

Maximum Capacity Considered Practical to Restore: This plant needs a small amount of repair work which can be done in one to two months time and then it can operate. Without additional clinker grinding equipment its capacity will be about 50,000 tons of cement per year. With the installation of more grinding mills perhaps 75,000 tons per year could be produced.

Equipment Needed for This Restoration:

(a) 4 transformers and controls
(b) Additional grinding mills for increased capacity of finished cement
(c) Electric power

Source of Raw Materials:

(a) Previous — Limestone - quarry one mile away
Clay - adjacent pit
Gypsum - Sansui
Coal - Fushun

(b) Future — Same sources

Stockpiles: Small

Former Distribution of Product: Finished cement - unknown.
Clinker - Anshan

Present Demand: There is a great need for cement at the present time in Manchuria. Reconstruction and repair of a large number of plants, dams, roads and houses will require cement in large quantities.

Present Owner: Chinese Government

Remarks: This is a rather small cement plant which was an integral part of the industries at Anshan. Apparently it was located here so as to be near a good source of limestone and clay. It can be made a successful operation for future use.

PREPARED BY

N. M. Taylor

## MANCHURIA ASANO CEMENT COMPANY, LTD.

**Location:** Chinhsi

**Date Visited:** 8 June 1946 by Hendricks, Thorne, Martin and party of Chinese led by Mr. Hoo, A. K. of the Northeast Chinese Economic Commission.

This plant was built in 1939 with second-hand equipment from Meji, Japan. It has 2 dry process kilns with a combined capacity of about 120,000 metric tons of cement per year. Limestone was brought down from the molybdenum mine at Yanchantantsi, coal from Fouhsin, gypsum from Shansi Province of North China, and good clay was available locally. Power came from the hydro network, largely dependent on the Yalu River plant.

Cement has not been produced since the Japanese surrender. No plans have been made to resume production. According to Mr. Hoo, there is some doubt as to whether the products of this plant will be needed and until the Chinese Army or the National Government indicates an urgent requirement for its cement capacity, no further steps will be taken, even if power should become available.

The plant contained a boiler and 1800 kw generator designed to utilize the hot gases produced in the kilns. Grates have been improved under the boiler and about 1500 kwh of power is being produced, the main source of power for Chinhsi, Hulutao, and Chinchow. The condition of the equipment is such that one of the two boilers is always under repair, no attempt being made to fire more than one at a time. However, the generator is dated 1938 and in good shape.

According to Mr. Hoo the Soviets did not remove anything from the plant but permitted, if not encouraged, the Chinese Communists to take away the usual haul of sundry equipment, large quantities of bags, some conveyor belts and motors.

PREPARED BY

E. M. Martin

## MANCHURIA ASANO CEMENT COMPANY, LTD.

**Location:** Kirin (about 43° 50'N 126° 30'E)

**Source and Reliability of Information:**

(a) Actual inspection of plant 1 July 1946 by Mr. John P. Hurndall.
(b) Japanese who was the former plant manager. He was considered fairly reliable and his information accepted as true. (See separate report on this plant submitted by him -- Source File 9-H-1.)
(c) Chinese Northeast Economic Commission who are considered fairly reliable and their information accepted as true.

**Date Put in Operation:** March 25, 1935

**Description of Product:** Portland cement, cement slate (3'x6' and 3'x3'), and lime.

**Production:** 220,000 tons per year. This was 1943 figure and is a good average.

**Plant Equipment:** Following is a list of the more important equipment as of 1 October 1945:

(a) 1 Gyratory crusher (no. 8 or 20" type)
(b) 2 Hammer crushers (1.25 x 1.25 M)
(c) 3 Raw material dryers (02.44 x 18.29 M)
(d) 2 Raw material and clinker mills (02.4 x 12 M)
(e) 3 " " " " " (0.25 x 12 M)
(f) 3 Coal dryers (02.0 x 13.7 M)
(g) 1 Coal Mill (02.0 x 7.0 M)
(h) 1 Coal Mill (02.0 x 7.5 M)
(i) 2 Rotary kilns with coolers (03.3 x 60.0 M)
(j) 2 Waste heat boilers (B&W) 1,085 square meters
(k) 2 Turbo generators 4120 KVA each
(l) 38 Transformers 2 to 300 KVA
(m) 137 Electric motors (1/2 to 1200 h.p.)
(n) 18 Machine tools

**Number of Employees:** At full operation - 1,000 men

**Removals:** This plant was occupied by the Soviet Army 9 October 1945 and immediately thereafter they issued orders to the Japanese manager to dismantle the entire plant for the purpose of loading all machinery and equipment on railroad cars for shipment to the USSR. Japanese employees from the cement plant as well as from adjacent plants were employed for this work, which was started 11 October 1945. On 23 October the first 20 carloads were taken away, and this continued until 1 November 1945 when the last 38 cars were moved, making a total of 83 carloads, or about 1,300 tons of material. Following is a list of the major items removed by the Soviet Army:

| | | |
|---|---|---|
| (a) | 2 | Raw material crushing machines - hammer crushers (1.25 x 1.25 M) |
| (b) | 2 | Clay dryers (raw material dryers) |
| (c) | 3 | Coal dryers (02.0 x 13.7 M) |
| (d) | 2 | Coal mills |
| (e) | 2 | Blowers for rotary kilns |
| (f) | 1 | Cement grinding machine (clinker mill) |
| (g) | 2 | Bagging machines |
| (h) | 2 | Waste heat boilers |
| (i) | 2 | Turbo generators (4120 KVA each) and controls |
| (j) | 107 | Electric motors (various sizes) |
| (k) | 2 | Transformers |
| (l) | 18 | Construction machines (various types) |
| (m) | All | laboratory equipment |

Destruction: The job of removing equipment from this plant was so hurried that a great deal of destruction took place of the remaining machinery and buildings. In short, the plant was wrecked at the time of removals (11 October 1945 to 2 November 1945). After that date, remaining Soviet guards sold to the local Chinese some of the material that was left behind. Among these were 6 motors, felt cloth for slate manufacture, belts, etc.

Maximum Capacity Considered Practical to Restore: It is essential that a large quantity of cement be made available in this area to complete the construction of the nearby Tafengmen dam on the Sungari River. This cement plant primarily was operated for this purpose and therefore either the plant should be restored to its original capacity or arrangements made to bring in cement from some other existing and operating Manchurian cement plant.

Equipment Needed for This Restoration: Almost a complete new cement plant is needed with the exception of the two rotary kilns. Some of the existing buildings and structures can be used again if considerable reconstruction is done. (See Removals)

Source of Raw Materials:

(a) Previous — Limestone - Panshih and Shihorin Quarry
Clay - West 1.5 miles from cement plant
Pyrite cinder - Tailings of the sulphuric acid factory at Anshan and Fushun

Gypsum - Tanyun in Sanshi district
Asbestos powder - Tounhowa district
Coal - Fushun and Shuang

(b) Future — Probably the same sources

Stockpiles:

(a) Raw Materials — Limestone - 1,380 tons
Clay - 2,450 tons
Pyrite cinder - 2,200 tons
Gypsum - 3,500 tons
Asbestos powder - 120 tons
Pulp - 40 tons

(b) Finished Products — Portland cement - 2,400 tons
Cement slate (3' x 6') 14,500 sheets
Lime - 500 tons

Former Distribution of Products: Chiefly for the construction of the Tafengmen dam.

Immediate Future Demands for Products: Large. (See Removals)

Name of Present Plant Manager: Mr. Lun Chou Chin. Ownership is in Chinese Nationalist Government.

Name of Soviet Official Handling Removals: Major Tolmachol

Notes on Processes: Portland Cement - dry process with waste heat boilers and turbo generators
Cement slate - Hoch-Eack system

PREPARED BY

N. M. Taylor

## I. I. TSCHURIN COMPANY*

(Formerly Harbin Cement Company)

Location: Harbin (45° 45'N 126° 40'E), about 8 miles east of town.

Source and Reliability of Information: Actual inspection 1 July 1946 by Messrs. Norman Taylor and Leininger (SSU). Russian civilian engineer-manager of plant. This man, whose reliability cannot be judged, seemed honest in his statements and by the nature and condition of the plant it can be assumed that all his information is possibly true to the extent of his knowledge. He did not see the plant under Japanese operation but talked with the former Japanese operators. He has been in charge for about 2 months.

Date Put in Operation: 1935

Product: Bagged Portland Cement

Best Production: About 95,000 tons/yr.

Outline of Plant Equipment as of This Date: This is a conventional dry process Portland cement plant with the usual plant equipment. The major pieces are as outlined below:

(a) 1 crusher for limestone rock
(b) 1 rotary kiln
(c) Coal pulverizing unit and burners for kiln
(d) 2 clinker grinding rod mills
(e) 2 bagging machines
(f) 2 overhead clamshell cranes

Employees: 230-240. There is some doubt regarding this figure. It seems low.

Removals and Destruction: There were no removals nor destruction to speak of. Possibly some of the belting had been taken by local people but when questioned as to the missing belts, the Russian manager stated they were on hand. At the time of this inspection, Chinese civilian guards were posted about the plant property.

Maximum Capacity of This Plant: In the immediate future it will be considerably below 95,000 tons per year. The whole plant, while intact, is in a run-down condition. The main rotary kiln is warped, the drive gears on one of the two clinker rod mills are worn out, and one of the overhead cranes is not operating. Before any cement can be produced, a good deal of inspection and minor repair work must be done. This would take two to four months and then the plant can run at about [illegible] to [illegible] capacity. However, no repair work is going on now and the manager stated there were no plans, either for repairing or resuming operations.

---

*Reported to be a Soviet firm.

Sources of Raw Materials:

a, Previous — Limestone - quarries about [illegible] miles away at [illegible]
Coal - [illegible]
Clay - Adjacent pit
Power - [illegible]

b, Future — Probably the same sources

Stockpiles of Raw Materials: None were on hand

Former Distribution of Finished Product: There was no direct information as to the former distribution of the finished cement. It was noted one of the bagging machines fed to a spur railroad track and the other bagging machine fed to a dock on the Sungari River. This would indicate water transportation to areas along the river.

Immediate Future Demands for Product: As for all of Manchuria, this is a big need here for cement to be used in reconstruction of houses and industrial plants, etc.

Present Owner: Tschurin Company of Harbin

Notes of Processes: Nothing outstanding except that the plant layout seemed well planned for the easy flow of the raw material to the finished product.

Remarks: This plant seems to be located an unusually long distance from a suitable limestone quarry and with the deteriorated condition of railroads in this area there is some doubt as to whether cement can be produced economically if at all. See Source File 302-O-1 for further details.

PREPARED BY

N. M. Taylor

Appendix 11 Plant Inspection Report 29-H-1

## MANCHURIA ONODA CEMENT COMPANY, LTD.
(also known as Shawa Cement Works)

Location: Changtu, Manchuria (124° 01'E - 42° 47'N)

Date Visited: 16 June 1946 by Messrs. Cleaveland, Thorne, Hendricks, and Captain Earl Scott.

Description of Product: Portland cement in bags and barrels

Best Previous Production and Year: 500 tons per day in 1943 (reported by the Chinese foreman of a labor crew at the plant). This would constitute about 10% of the total Manchurian cement production.

Outline of Plant Equipment: Narrow guage railroad, locomotives and ore cars to move raw materials to the plant; conveyor belt unloading equipment; limestone crushing and grinding equipment; 2 kilns for drying iron ore and slag; overhead crane and mixing equipment; 1 furnace (kiln) 200 m. x 3.m. with sixteen-lm x 6m. cooling drums on lower end; clinker crushing equipment; 2 gas generators and a gas blower; machine shop and foundry.

Removals: All motors except the large motor for rotating the cement kiln. All crushing equipment for raw material and cement clinker. All conveyor belts. No data were available as to the dates of removals.

Destruction: 2 small transformers wrecked; 2 small brick drying kilns for iron ore slag, etc., dynamited; control instruments wrecked.

Maximum Capacity Considered Practical to Restore: The entire plant could be restored as the gas generators, gas blower, main rotary kiln, with its drying drums, the overhead crane, the narrow gauge railroad and its rolling stock, the large motor for rotating the furnace, and all buildings are essentially intact.

Equipment Needed for Restoration: See removals and destruction

Source of Raw Materials: Limestone and clay came from a quarry 6 km. from the plant by narrow gauge railroad. Iron ore and slag came from Anshan. Gypsum came from Taiyuanfu. Coal came from Fushun or Penchihu. Future sources of raw materials would be the same as in the past.

Stockpiles: Raw materials in stockpiles were estimated as follows: limestone 2,500 tons, coal 250 tons, iron ore and slag 200 tons. There were no visible stocks of finished products.

Former Distribution of Product: All products went to the Cement Control Association.

Immediate Future Demands for Product: Cement will be needed for reconstruction of all industrial plants, bridges, etc., in Manchuria. However, the condition of other plants may be such that they can supply current needs.

Names of Soviet Officials Handling Removals: Unknown

Notes on Process: Process was completely standard. The quality of raw materials was good. The finished product should be of good grade.

Remarks: This plant was visited in passing on the railroad. There were no officials present who knew details. It is possible that some details could be supplied by the Northeast Economic Commission headquarters.

PREPARED BY

T. A. Hendricks

## INDIVIDUAL CEMENT PLANT SUMMARY REPORTS

The following fourteen (14) reports have been compiled in order to summarize all available data on each cement plant in Manchuria. Sources have been listed at the end of each report. Plant Inspection Reports on those visited by the Pauley Mission follow in this Appendix.

Appendix 11

## MANCHURIA ONODA CEMENT COMPANY, LTD.

| | |
|---|---|
| Location: | Harbin (about 126°35'E - 45°N)<br>Kirin Province |
| Map Reference Number: | 1 (Chapter XI) |
| Political Jurisdiction of Territory, July 1946: | Chinese Communists |
| Present Management: | I. I. Tschurin and Company<br>(Reported to be a Soviet firm) |
| Capacity Prior to August 1, 1945: | 110,000 MT |
| Best Production and Year: | 76,847 MT - 1940 |
| Present Capacity: | 30,000 MT |
| Reason for Change: | Needs repair work and replacement of parts (cement grinding reduction gears) |
| Capacity Loss due to Soviet Removals: | Small |
| Value of Equipment Prior to August 1, 1945: | $1,266,740 |
| Pauley Mission Inspection and Date: | Norman Taylor, Leininger (SSU) - 2 July 1946 |

REFERENCES used to compile above information:

File 11-H-1 (Plant Inspection Report by Pauley Mission)
Source File 303-H-1
" " 302-Y.1-1
" " 305-H-1
" " 303-TX-1

Appendix 11

## MANCHURIA ONODA CEMENT COMPANY, LTD.

Location: Mutanchiang (about 129°40'E - 44°35'N)
Kirin Province

Map Reference Number: 2 (Chapter XI)

Political Jurisdiction of Territory, July 1946: Chinese Communist

Present Management: Unknown

Capacity Prior to August 1, 1945: 100,000 MT

Best Production and Year: 71,598 MT - 1941

Present Capacity: Zero

Reason for Change: USSR removals of major machinery

Capacity Loss due to Soviet Removals: 100% or 100,000 MT (probable)

Value of Equipment Prior to August 1, 1945: $1,994,705

Pauley Mission Inspection and Date:

On 30 June 1946 members of the Pauley Mission were in Mutanchiang and requested permission from the local Chinese Communist Mayor to see the plant. He and his political commissar stated that the plant did not exist. We insisted that it did and showed them some evidence (obtained from several sources) of its production, etc. They stated there was no cement plant in Mutanchiang or the immediate vicinity and that we were mistaken. The matter could be carried no further at the time but later we received definite assurance from former Japanese Cement Association officials and the Northeast Chinese Economic Commission that up to 15 August 1945, there was a cement plant in operation at Mutanchiang. Furthermore, evidence was secured from Japanese who had been in that area, during the Fall of 1945, that the cement plant had been stripped of its major machinery by the Soviets and looted of other items by the local Chinese.

In view of this and the fact we were denied permission by the Communists to see the plant, we were led to the conclusion that the plant no longer can produce cement and that the USSR is responsible for its condition.

REFERENCES used to compile above information:

Source File 303-H-1
" " 302-Y.1-1
" " 305-IT-1
" " 303-TX-1
JANIS, Ch. IX, Pt. II, p.163

Appendix 11

# MANCHURIA ONADA CEMENT COMPANY, LTD.

| | |
|---|---|
| **Location:** | Changtu (about 124°01'E - 42°47'N)<br>Liaoning Province |
| **Map Reference Number:** | 3 (Chapter (XI) |
| **Political Jurisdiction of Territory, July 1946:** | Chinese Nationalist |
| **Present Management:** | Chinese Nationalist Government |
| **Capacity Prior to August 1, 1945:** | 140,000 MT |
| **Best Production and Year:** | 108,142 MT - 1942 |
| **Present Capacity:** | Zero |
| **Reason for Change:** | USSR removal of main machinery such as crushers, grinders and electric motors |
| **Capacity Loss due to Soviet Removals:** | 100% or 140,000 MT |
| **Value of Equipment Prior to August 1, 1945:** | $1,153,800 |
| **Pauley Mission Inspection and Date:** | Thomas A. Hendricks - 15 June 1946 |

REFERENCES used to compile above information:

File 29-H-1 (Plant Inspection Report by Pauley Mission)
Source File 303-H-1
" " 302-Y.1-1
" " 305-H-1
" " 303-TX-1

Appendix 11

## MANCHURIA ONODA CEMENT COMPANY, LTD.

| | |
|---|---|
| Location: | Anshan (about 122°55'E - 41°07'N)<br>Liaoning Province |
| Map Reference Number: | 4 (Chapter XI) |
| Political Jurisdiction of Territory, July 1946: | Chinese Nationalist |
| Present Management: | Chinese Nationalist Government |
| Capacity Prior to August 1, 1945: | 200,000 MT |
| Best Production and Year: | 141,160 MT - 1942 |
| Present Capacity: | 100,000 MT |
| Reason for Change: | Replacement of small parts. Reduction in raw materials due to shutting down of Anshan Steel Works (slag) and partial loss of clinker supplied from Hsiaotung plant. |
| Capacity Loss due to Soviet Removals: | Small |
| Value of Equipment Prior to August 1, 1945: | $396,744 |
| Pauley Mission Inspection and Date: | Elias and Johnston - 13 June 1946 |

REFERENCES used to compile above information:

File 2-H-1 (Plant Inspection Report by Pauley Mission)
Source File 303-H-1
" " 305-H-1
" " 302-Y.1-1
" " 303-TX-1
" " 201-W-1 (Section 9, Industry 19)

Appendix 11

## MANCHURIA ONODA CEMENT COMPANY, LTD.

| | |
|---|---|
| Location: | Hsiaotung (about 123°15'E - 41°15'N), Liaoning Province, about 10 miles east of Liaoyang on railroad between Penchihu and Liaoyang |
| Map Reference Number: | 5 (Chapter XI) |
| Political Jurisdiction of Territory, July 1946: | Chinese Nationalist |
| Present Management: | Chinese Nationalist Government |
| Capacity Prior to August 1, 1945: | 125,000 MT |
| Best Production and Year: | 95,106 MT - 1944 |
| Present Capacity: | 50,000 MT |
| Reason for Change: | The prior capacity included clinker manufactured for Anshan. Present capacity is total of grinders. To increase, more grinders will have to be installed. Transformers were also removed by Soviets. |
| Capacity Loss due to Soviet Removals: | Small |
| Value of Equipment Prior to August 1, 1945: | $2,002,503 |
| Pauley Mission Inspection and Date: | Norman Taylor, John P. Hurndall - 11 June 1946 |

REFERENCES used to compile above information:

File 2-H-4 (Plant Inspection Report by Pauley Mission)
Source File 303-H-1
" " 305-H-1
" " 302-Y.1-1
" " 303-TX-1

# TUMAN CEMENT COMPANY

| | |
|---|---|
| Location: | Miaoling (about 124°55'E - 42°12'N)<br>Kirin Province |
| Map Reference Number: | 6 (Chapter XI) |
| Political Jurisdiction of Territory, July 1946: | Chinese Communist |
| Present Management: | Unknown |
| Capacity Prior to August 1, 1945: | 90,000 MT |
| Best Production and Year: | 36,447 MT - 1943 |
| Present Capacity: | Zero |
| Reason for Change: | USSR removal of main machinery and destruction by local Chinese (Japanese report) |
| Capacity Loss due to Soviet Removals: | 100% or 90,000 MT (probable) |
| Value of Equipment Prior to August 1, 1945: | $4,181,915 |
| Pauley Mission Inspection and Date: | None |

REFERENCES used to compile above information:

Source File 303-H-1
" " 302-Y.1-1
" " 305-H-1
" " 303-TX-1

Appendix 11

## KWANTUNG-SHU ONODA CEMENT COMPANY

| | |
|---|---|
| **Location:** | Dairen (about 121°40'E - 39°05'N)<br>Kwantung Leased Territory |
| **Map Reference Number:** | 7 (Chapter XI) |
| **Political Jurisdiction of Territory, July 1946:** | USSR |
| **Present Management:** | Unknown |
| **Capacity Prior to August 1, 1945:** | 210,000 MT |
| **Best Production and Year:** | 172,047 MT - 1942 |
| **Present Capacity:** | 100,000 MT |
| **Reason for Change:** | Machinery is old and needs many replacements |
| **Capacity Loss due to Soviet Removals:** | Probably small this date (July 1946) |
| **Value of Equipment Prior to August 1, 1945:** | $1,529,190 |
| **Pauley Mission Inspection and Date:** | None |

REFERENCES used to compile above information:

Source File 303-H-1
" " 305-H-1
" " 302-Y.1-1
" " 303-TX-1

Appendix 11

## MANCHURIA ASANO CEMENT COMPANY, LTD.

| | |
|---|---|
| **Location:** | Kirin (about 126°25'E - 43°50'N)<br>Kirin Province |
| **Map Reference Number:** | 8 (Chapter XI) |
| **Political Jurisdiction of Territory, July 1946:** | Chinese Nationalist |
| **Present Management:** | Chinese Nationalist Government |
| **Capacity Prior to August 1, 1945:** | 260,000 MT |
| **Best Production and Year:** | 223,436 MT - 1942 |
| **Present Capacity:** | Zero |
| **Reason for Change:** | USSR removed major machinery and damaged remaining equipment and buildings |
| **Capacity Loss due to Soviet Removals:** | 100% or 260,000 MT |
| **Value of Equipment Prior to August 1, 1945:** | $1,641,371 |
| **Pauley Mission Inspection and Date:** | John P. Hurndall - 1 July 1946 |

REFERENCES used to compile above information:

File 9-H-1 (Plant Inspection Report by Pauley Mission)
Source File 303-H-1
" " 304-X-1, p. 2
" " 113-ZZX-1, p. 3, para 2
" " 305-H-1
" " 302-Y.1-1
" " 303-TX-1

Appendix 11

## MANCHURIA ASANO CEMENT COMPANY, LTD.

| | |
|---|---|
| Location: | Chinhsi (about 120°55'E - 40°45'N)<br>Liaoning Province |
| Map Reference Number: | 9 (Chapter XI) |
| Political Jurisdiction of Territory, July 1946: | Chinese Nationalist |
| Present Management: | Chinese Nationalist Government |
| Capacity Prior to August 1, 1945: | 150,000 MT |
| Best Production and Year: | 111,709 MT - 1943 |
| Present Capacity: | 50,000 MT |
| Reason for Change: | Soviets encouraged Chinese removals of small machinery and electrical equipment. These will have to be replaced and other repairs made to gain back production. |
| Capacity Loss due to Soviet Removals: | Small--directly chargeable to Soviets; but 66.66% or 100,000 MT, indirectly. |
| Value of Equipment Prior to August 1, 1945: | $2,623,279 |
| Pauley Mission Inspection and Date: | Edwin W. Martin - 9 June 1946 |

REFERENCES used to compile above information:

File 6-H-1 (Plant Inspection Report by Pauley Mission)
Source File 303-H-1
" " 305-H-1
" " 302-Y.1-1
" " 303-TX-1
" " 201-W-1 (Section 9, Industry 22)

Appendix 11

# MANCHURIA ASANO CEMENT COMPANY, LTD.

| | |
|---|---|
| **Location:** | Fushun (about 123°56'E - 41°52'N)<br>Liaoning Province |
| **Map Reference Number:** | 10 (Chapter XI) |
| **Political Jurisdiction of Territory, July 1946:** | Chinese Nationalist |
| **Present Management:** | Chinese Nationalist Government |
| **Capacity Prior to August 1, 1945:** | 210,000 MT |
| **Best Production and Year:** | 181,104 MT - 1942 |
| **Present Capacity:** | 80,000 MT |
| **Reason for Change:** | Needs repair work and replacement of worn out parts (grinding machines) |
| **Capacity Loss due to Soviet Removals:** | Small |
| **Value of Equipment Prior to August 1, 1945:** | $1,976,179 |
| **Pauley Mission Inspection and Date:** | Edwin W. Martin - 3 June 1946 |

REFERENCES used to compile above information:

File 1-H-1 (Plant Inspection Report by Pauley Mission)
Source File 303-H-1
" " 303-Y.4-4 p.4
" " 305-H-1
" " 303-Y.1-1
" " 303-TX-1
" " 201-W-1 (Section 9, Industry 21)

Appendix 11

## MANCHURIA IWAKI CEMENT COMPANY

| | |
|---|---|
| Location: | Liaoyang (about 123°10'E - 41°20'N)<br>Liaoning Province |
| Map Reference Number: | 11 (Chapter XI) |
| Political Jurisdiction of Territory, July 1946: | Chinese Nationalist |
| Present Management: | Chinese Nationalist Government |
| Capacity Prior to August 1, 1945: | 180,000 MT |
| Best Production and Year: | 150,623 MT - 1942 |
| Present Capacity: | 90,000 MT |
| Reason for Change: | Needs repairs and will probably lack raw materials and skilled labor. |
| Capacity Loss due to Soviet Removals: | Small |
| Value of Equipment Prior to August 1, 1945: | $3,174,653 |
| Pauley Mission Inspection and Date: | Elias, Einig, Fenical - 9 June 1946 |

REFERENCES used to compile above information:

File 2-H-3 (Plant Inspection Report by Pauley Mission)
Source File 303-H-1
" " 305-H-1
" " 302-Y.1-1
" " 303-TX-1
" " 201-W-1 (Section 9, Industry 18)

Appendix 11

## MANCHURIA IWAKI CEMENT COMPANY

| | |
|---|---|
| **Location:** | Penchihu (about 123°45'E - 41°25'N)<br>Liaoning Province |
| **Map Reference Number:** | 12 (Chapter XI) |
| **Political Jurisdiction of Territory, July 1946:** | Chinese Nationalist |
| **Present Management:** | Chinese Nationalist Government |
| **Capacity Prior to August 1, 1945:** | 250,000 MT |
| **Best Production and Year:** | 204,331 MT - 1942 |
| **Present Capacity:** | 100,000 MT |
| **Reason for Change:** | Electric generating equipment removed by Soviets. Plant needs repair work and replacements. |
| **Capacity Loss due to Soviet Removals:** | Small |
| **Value of Equipment Prior to August 1, 1945:** | $2,141,496 |
| **Pauley Mission Inspection and Date:** | Norman Taylor, John P. Hurndall - 10 June 1946 |

REFERENCES used to compile above information:

File 2-H-2 (Plant Inspection Report by Pauley Mission)
Source File 303-H-1
" " 305-H-1
" " 303-Y.1-1
" " 303-TX-1
" " 201-W-1 (Section 9, Industry 20)

Appendix 11

## MANCHURIA IWAKI CEMENT COMPANY

| | |
|---|---|
| Location: | Kungyuan (about 41°20'N - 123°45'E)<br>Liaoning Province |
| Map Reference Number: | 13 (Chapter XI) |
| Political Jurisdiction of Territory, July 1946: | Chinese Nationalist |
| Present Management: | Chinese Nationalist Government |
| Capacity Prior to August 1, 1945: | 170,000 MT |
| Best Production and Year: | 91,999 MT - 1943 |
| Present Capacity: | Zero |
| Reason for Change: | USSR removed major machinery and damaged remaining buildings and equipment. |
| Capacity Loss due to Soviet Removals: | Small |
| Value of Equipment Prior to August 1, 1945: | $5,185,412 |
| Pauley Mission Inspection and Date: | Norman Taylor, John P. Hurndall - 10 June 1946 |

REFERENCES used to compile above information:

| | | |
|---|---|---|
| File | 2-H-2 | (Plant Inspection Report by Pauley Mission) |
| Source File | 303-H-1 | |
| " " | 303-Y.1-1 | |
| " " | 305-H-1 | |
| " " | 303-TX-1 | |
| " " | 201-W-1 | (Section 9, Industry 20) |

Appendix 11

## ANTUNG CEMENT COMPANY, LTD.

| | |
|---|---|
| **Location:** | Antung (about 124°25''– 40°10'N)<br>Liaoning Province |
| **Map Reference Number:** | 14 (Chapter XI) |
| **Political Jurisdiction of Territory, July 1946:** | Chinese Communist |
| **Present Management:** | Unknown |
| **Capacity Prior to August 1, 1945:** | 130,000 MT |
| **Best Production and Year:** | 95,000 MT – 1943 |
| **Present Capacity:** | Zero |
| **Reason for Change:** | USSR removal of main machinery and destruction by local Chinese (Japanese report) |
| **Capacity Loss due to Soviet Removals:** | 100% or 130,000 MT (probable) |
| **Value of Equipment Prior to August 1, 1945:** | $3,643,252 |
| **Pauley Mission Inspection and Date:** | None |

REFERENCES used to compile above information:

Source File 303-H-1
" " 303-Y.1-1
" " 305-H-1
" " 303-TX-1

# TOKAWA WEAVING PLANT

**Location:** Shenyang (Mukden), Manchuria

**Date Visited:** 2 June 1946 by Edwin M. Martin and Mr. Koo of the Northeast Chinese Economic Commission.

This is a small weaving plant with about 250 looms that formerly made cloth for the Japanese Army. It employed 1200 persons on two shifts. Its equipment does not appear to be modern. Nothing has been touched except the belting which, according to the Chinese manager who arrived only a few weeks ago, was removed by the Chinese Communists on invitation from the Soviets. The plant has not operated since September 1945, principally for lack of power.

PREPARED BY

Edwin M. Martin

## MUKDEN COTTON SPINNING COMPANY

Location: North Market, Mukden, Liaoning Province, Manchuria

Date Visited: 1 June 1946 by Edwin M. Martin, Capt. E. M. Scott, and Mr. Koa of the Northeastern Chinese Economic Commission.

Source and Reliability of Information: Mr. Koa - reliable; Chinese Summary List - fairly reliable.

This plant was put in operation in June 1923. Most of the equipment is American-made and was about 35 years old. Their products were cotton cloth and cotton yarn. They operated under the maximum capacity of 30,000 yards of cloth per day and 20,000 pounds of cotton yarn per day.

The original equipment consisted of 500 looms and 30,000 spindles. Ten thousand of the spindles were destroyed by fire in 1932. During peak operations this plant was supposed to have employed 1500 people.

There were no apparent removals of equipment; however, the Chinese reported the following removals of materials: (1) cotton yarn, 4,100 bundles; (2) cotton cloth, 15,000 pieces; and (3) raw materials amounting to 3,372 bundles of cotton. They list this loss at $22,808,000 U.S. This dollar figure cannot be confirmed, of course. These removals were reported to have occurred on 20 August 1945. As a result of a fire set by Soviets, the Chinese report the destruction of 1 factory building (7,700 $M^2$) and 400 spinning machines. The Chinese have reported the equipment lost in the fire as removals. Actually there were no removals of equipment, nor can we confirm report that the Soviets set fire to the plant.

The Chinese consider it practical to restore enough equipment to produce about 12,000 yards of cloth per day. They maintain this could be done with belting, 350 looms and minor repairs. The previous source of raw materials for this plant is not known, but presumed to be supplied from the cotton areas of Liaoning Province and is expected to be the source in the future.

There were no stockpiles of raw materials or finished products on hand at the time of this inspection. Formerly, the products of this plant were distributed locally to the merchants of the Mukden area.

PREPARED BY

Captain E. M. Scott

Appendix 12 Plant Inspection Report 1-K-4

## TOE HAI COTTON SPINNING COMPANY, LTD.

**Location:** Mukden, Manchuria

**Date Visited:** 1 June 1946

**Source and Reliability of Information:** This plant was inspected by Edwin M. Martin of the U. S. Reparations Mission. Additional information was obtained from the Chinese Northeast Economic Commission which generally is reliable but in this case there seems to be a difference between its estimates of removals and destruction and those of the inspection party.

**Description of Product:** Cotton yarn and cotton fabrics.

**Best Previous Production and Year (or Capacity):** Annual capacity as given us by the Chinese Northeast Economic Commission: 26,581 B/S cotton yarn and 65,988 pcs. cotton yarn.

**Plant Equipment:** 50,048 spindles, 250 looms, and the usual other spinning mill equipment and buildings.

**Removals and Dates:** There appeared to be no large-scale removals; however, the works of all the looms are gone. In addition, there was a large burned-out building which had a loading platform all along one side adjoining a railroad track and a large portion of the equipment in the rooms on this side of the building have been removed. The equipment in most of the other rooms, including some large motors, seems to be intact.

**Destruction and Dates:** The repair shop, power building, looms building, offices and several smaller buildings have been burned out. It is suspected that these caught fire during the removal program and were abandoned after the fire. The remaining equipment is subject to a great deal of deterioration due to weathering and lack of any protection.

**Estimated Losses:** The estimate of the Chinese Northeast Economic Commission that 100 per cent of the productive capacity had been lost by removals probably is not correct. However, the productive capacity has been lost due to the destructive fire, coupled with small-scale removals and it is doubtful if any of the remaining equipment can be used.

Report written from information PREPARED BY

Edwin M. Martin

## KOTOKU DYEING FACTORY

**Location:** Mukden, Manchuria

**Date Visited:** 1 June 1946 by Edwin M. Martin and Mr. Koa of the Northeastern Chinese Economic Commission.

This is one of the larger dyeing plants in Mukden with a reported capacity of 15,000,000 pieces per year. The Chinese report indicated 5 per cent removal. About 50 per cent of the electric motors, plus the stockpile on hand of dyeing materials, was removed. The rest of the equipment is intact and apparently in good shape. No attempt is being made at present to operate the plant. The Chinese report the motors were removed by the Soviets. Some information on original equipment in reports prepared by Japanese in Tokyo on Pulp, Paper and Textile Plants in Manchuria.

PREPARED BY

Edwin M. Martin

## TOHAWA DYEING FACTORY

**Location:** Mukden, Manchuria

**Date Visited:** 2 June 1946

This plant was reported to have had a capacity of 15,000,000 pieces per year. It dyed cloth for the Japanese Army and wove a small amount of ribbon-type goods. The dyeing facilities and all the electrical motors, transformers, etc., have been removed. Only the relatively few looms and two small boilers are left. It employed about 400 persons.

PREPARED BY

Edwin M. Martin

# SOUTH MANCHURIAN COTTON SPINNING COMPANY

**Location:** Suchiatun, Liaoning Province, Manchuria

**Date Visited:** 13 June 1946

This plant was inspected by Edwin M. Martin accompanied by Mr. Chen Shik Chang of the Northeast Chinese Economic Commission offices in Mukden.

No managerial or technical personnel are now attached to the plant. Some information was provided by a Korean plant guard who is still at the plant, an untrained but apparently intelligent observer.

The plant with 35,000 spindles and about 1050 looms was built in 1942 and equipped with new machinery from Japan. It was managed and operated by Koreans and had about 3000 employees. According to the Korean guard reports were current that the plant was built with Korean rather than with Japanese or Manchurian capital. This could not be checked. According to the Korean plant guard, the Soviets arrived at the plant early in November, removed stocks of cotton goods and one or two large motors, and then set fire to the plant. Subsequent to the fire, which was largely confined to the roofs, local Chinese ransacked the plant for anything useful they could carry away. Most of the machinery is badly rusted by exposure. The transformer station--the plant depended on outside electric power--was burned and could be put back into use with replacements. The boiler room for making process steam contains 3 small but new boilers intact. I estimate they might have a horsepower capacity of 300 - 500 each.

It is clear that the report of the Chinese to the effect that Soviets removed 100 per cent of the equipment from this plant is incorrect, but losses due to the activities of the Soviets may be large. It is also believed that the value of $45,000,000 U.S. on materials removed is exaggerated.

PREPARED BY

Edwin M. Martin

# MANCHUKUO AND MONGOLIA WOOLEN TEXTILE COMPANY

**Location:** Mukden, Liaoning Province, Manchuria

**Date Visited:** 1 June 1946 by Mr. Edwin M. Martin, Captain Earl M. Scott, and Mr. Koa (Chinese).

**Source and Reliability of Information:** Information for this report was obtained from Mr. Koa (reliable); report by Japanese in Tokyo on factories in Manchuria (fairly reliable); and Summary List prepared by Chinese (fairly reliable).

**Date Put in Operation:** This plant was originally built in 1918.

**Product:** Spun wool and rug material.

**Best Previous Production and Year:** It was producing per year during World War II:

600,000 blankets
150,000 pieces worsted cloth
840,000 pieces serge
720,000 pieces woolen fabrics

**Plant Equipment:** The equipment of this plant consisted of the following:

20 carding machines
200 weaving machines (spun wool)
4 drying machines
3900 spindles
70 weaving machines (coarse wool)

**Employees:** 300 Japanese and 3500 Chinese were employed by the factory when it was operating.

**Removals and Dates:** We were told during the inspection (by the Chinese Manager) that approximately 90 per cent of all plant equipment was taken from this plant by the Soviet Army. It was valued by the Chinese at approximately $18,000,000 U.S. The percentage figure was confirmed by observation. 1200 tons of finished products were also removed.

**Comments on Restoration:** Restoration of this plant would be a task similar to rebuilding. The advisability of such an undertaking would depend upon the demand for its products, which in this case is large.

PREPARED BY

Captain E. M. Scott

## MANCHU COTTON SPINNING AND DYEING COMPANY

**Location:** Liaoyang - 1 mile east of Railroad Station, Liaoning Province, Manchuria.

**Date Visited:** 11 June 1946, in company with Messrs. Tung; Ling Chang of the Northeast Chinese Economic Commission; Lu, Manager of the Manchu Cotton Spinning and Dyeing Company; and N. M. Elias of the US Reparations Mission. The data were furnished by Messrs. Lu and Chang.

The Company was established in 1924 and the building is of brick and wood truss construction with manufacturing floor space of 38,880 square meters.

Raw material is Manchurian cotton.

The plant is not in operation due to lack of power which was shut off in March 1946.

Prior to August 15, 1945, the maximum number of employees was 3000, with a staff of 45. No Japanese were employed as laborers.

The total number of spindles is 78,000 although the maximum ever in operation at any one time never exceeded 40,000 and the employment was based on 40,000 spindles.

Power was obtained from the electric grid and the plant has 6 Lancashire boilers for low pressure steam for processing and uses 40 to 50 tons of steam per day. The Liaoyang transformer station is intact and capable of operation when current is available.

Power required for starting the plant is 500 to 1000 kw and 2500 kw is required for full operation. Plant uses 220 V. and 550 V. current of 50 and 60 cycles and the transformers, switch boards, electric meters and starting equipment are all in operating condition.

Normal capacity is 42,000 bondos of thread (bondo = 415') annually of which some was sold and the remainder woven into cloth of which the annual production was 400,000 bolts of 40 yards each. 240,000 bolts were dyed, the chlorine coming from Mukden.

During the Soviet occupation, the plant was in operation and the Soviets took the product. The Soviets removed no equipment but a number of sewing machines were stolen by Chinese Communists.

On Friday, June 14, 1946, the writer met Mr. Chang at Liaoyang and was informed that 14 carloads of coal had arrived in Liaoyang which would permit operation of the Manchu Iwaki Cement Company auxiliary boilers and small generating plant (see Plant Inspection Report 2-H-3 in Appendix 11), which would in turn furnish power to the Manchu Cotton Spinning and Dyeing Company and permit resumption of operations within a few days.

PREPARED BY

A. B. Einig

# LIAOYANG JUTE SACK FACTORY

**Location:** Liaoyang, Liaoning Province, Manchuria

**Date Visited:** 9 June 1946 by Messrs. Elias, Einig, and Capt. Fenical

This plant is located about 3 kilometers south of railroad station. It is not now in operation because of lack of power, which it obtains from the hydroelectric grid and Fushun Steam Plant.

The raw material is jute, grown in considerable quanity all around the local area. The plant makes thread as a finished product as well as sacks. The thread-making capacity is 150 MT/mo. It has 100 looms for bagging and has a capacity of 3,000,000 sacks per year. The normal consumers are Manchurian industries and farmers. Steam for process use is generated in 2 small Lancashire boilers. There are one thousand (1000) laborers when plant is operating full, and 120 office help. The factory was stated to have been built in 1937. The four large transformers of this plant had been wrecked and were still there. It was stated by the manager that the wrecking was an act of vandalism by the Chinese Communists. Power came in at 3000 volts and was stepped down to 400. Power consumption is 120,000 kwh per month. Still intact are 4 transformers (400 kva) and 4 transformers (100 kva).

The buildings were substantial brick buildings and in addition to the factory buildings, homes of brick were built both for the officials and for the laborers of the plant. The pay of the laborers was 3-1/2 yen per day, they were given rent free and allowed to buy their food for 0.2 yen per day. This was rationed. They had to provide for their own clothing. The floor area of the main building was about 115,000 sq. ft.

There were no removals in this plant.

PREPARED BY

N. M. Elias

## KOKOTU WOOLEN WEAVING COMPANY, LTD.

**Location:** Harbin, Manchuria (head office - Changchun)

**Date Visited:** 28 June 1946 by John P. Hurndall, Norman Cleaveland, Norman Taylor, Carleton B. Swift, Jr., and Captain E. M. Scott.

This mill produced woolen cloth and blankets. It produced 240,000 meters of each per year. It was equipped with 6 carding machines, 6 weaving machines, and 83 looms. The plant was established in 1937, is capitalized at 3,000,000 yen, and the principal shareholders were in Japan proper. The plant was operated by 543 employees.

At the time this plant was inspected, Japanese laborers were dismantling the equipment, apparently by direction of the Chinese Communists. It was stated that this equipment was being evacuated by the Communists to be installed elsewhere. When questioned, they would not reveal the locality.

PREPARED BY

Capt. E. M. Scott

## MANCHURIA HEMPEN ROPE COMPANY, LTD.

**Location:** Harbin, Manchuria (head office - Changchun)

**Date Visited:** This plant was not visited by the team in Harbin. The Communists who were our host in Harbin did not know where the mill was; therefore, we assumed the plant to have been stripped and burned. For the basis of this assumption, see report by Mr. Norman Cleaveland, "Chronological Report of Harbin Trip" (Appendix 2-b).

**Established:** November 1942

**Capitalization:** 1,000,000 yen

**Principal Share Holders:** Japanese interests

**Equipment:** 14 weaving machines; 7 finishing machines

**Product:** Hemp rope

**Capacity per Year:** 1,060,000 kg.

**Employees:** 117

PREPARED BY

Capt. E. M. Scott

Appendix 12 Plant Inspection Report 23-K-1

## TUNG MEIN SPINNING AND WEAVING COMPANY, LTD.

**Location:** Chinchow, Liaoning Province, Manchuria

**Date Visited:** 7 June 1946

**Source & Reliability of Information:** Mr. A. K. Woo, Manager of Plant - reliable

**Date Put in Operation:** 1938 - Japanese private capital

**Description of Product:** Cotton yarns - army fabrics - piece dyeing

**Best Previous Production & Year (or Capacity):** Cotton yarn, 34,529 b/s; cotton fabrics, 170,352 pcs.; piece dyeing, 9,000,000 m. Year not known.

**Plant Equipment:** 50,000 spindles and 1700 looms

**No. of Employees at Full operation:** 3000 Japanese and 500 school children as "Learners"

**Removals & Dates:** 7,000 bales of piece goods; 79 power sewing machines; stock of dyeing stuffs; some conveyor belts. Date not known.

**Destruction & Dates:** The Soviets dismantled some equipment but failed to remove it. Equipment has been reassembled.

**Equipment Needed for Restoration:** Conveyor belts and spare parts

**Stockpiles:** Taken by Soviets

**Former Distribution of Product:** Japanese Army

**Immediate Future Demands for Product:** All products now going to Chinese Army

**Names of Present Plant Managers:** Messrs. Lei, Shiun

**Notes on Process:** Standard American

**Remarks:** A machine shop--The Manchurian Prime Moving Manufacturing Company--was built on an adjoining piece of land in 1939. It produced parts for the cotton mill and for locomotives. Nearly all equipment, including 125 lathes and 4 planers, was bought new and was removed by the Soviets.

PREPARED BY

Edwin M. Martin

Appendix 12 Plant Inspection Report 23-K-2

## CHINCHOW WOOLEN MILL

| | |
|---|---|
| **Location:** | Chinchow, Liaoning Province, Manchuria |
| **Date Visited:** | 7 June 1946 |
| **Source & Reliability of Information:** | Mr. A. K. Woo; Mr. Fung Ting Tu (Chinese Manager). Information given confirmed by inspection of Mill. |
| **Date Put in Operation:** | Japanese were preparing to install a gunny sack plant. At the time of surrender, only part of the factory equipment had arrived and is still crated at the site. |
| **Description of Product:** | Worsted cloth and wool cloth to be produced by Chinese who are converting the proposed gunny sack factory to a woolen mill. |
| **Planned Capacity:** | 60,000 yards worsted cloth and 40,000 yards of wool cloth per year. |
| **Plant Equipment:** | 2400 worsted spindles; 1600 wool spindles; and 117 cotton looms being converted to wool looms. |
| **No. of Employees:** | Planned: 1500 in 2 shifts |
| **Name of Present Plant Manager:** | Mr. Fung Ting Tu |

PREPARED BY

Edwin M. Martin

Appendix 13 Plant Inspection Report 8-D-1

## MANCHURIAN SPECIAL PAPER MANUFACTURING COMPANY

**Location:** Changchun ("Hsinking"), Kirin Province

**Date Visited:** 6 June 1946

**Product:** Manufactures reclaimed paper to be used for newspapers

**Capacity:** Present capacity, 1/2 M/T; full capacity, 1 ton daily

**Employees:** 55 employees

**Present Status:** Operating - no war damage

(The nearby "Matsuyama Seisha" - manufacturing toilet paper - appeared to be intact and operating, but was not inspected. This is only 1 plant of 3 which make up the Manchurian Special Paper Manufacturing Company. In 1944 it produced 143 tons of toilet paper. It has 1 paper-making machine complete.)

PREPARED BY

Lt. Col. H. G. Schenck

Appendix 13 Plant Inspection Report 11-D-1

## CHIHUA PAPER COMPANY (formerly Haido Paper Company)

| | |
|---|---|
| Location: | Harbin, Kirin Province, Manchuria |
| Date Visited: | 1 July 1946 |
| Source of Information: | Chinese workers at plant. Information appears reliable. |
| Date Put in Operation: | 1939 |
| Product: | Ceremonial paper |
| Production Capacity: | 5,000 pounds per day |
| Equipment: | 5-pulp washers, driers, rolls, printing machine, cutters, and packaging equipment |
| Number of Employees: | 90 |
| Source of Raw Material: | Paper pulp and scrap paper from nearby area |
| Stockpiles: | Several tons of pressed paper pulp and large piles of scrap paper |
| Distribution of Product: | Locally for Chinese ceremonials, principally for funerals |
| Process: | Paper pulp and scrap paper are disintegrated, worked, and repressed by rolling into thin tissue paper. When the tissue is dry it is cut and folded into sheets about 18 inches square. Any desired characters or pictures may be printed on the sheets. For funerals, money and messages are printed on the sheets and burned at the grave of the deceased to help him along his way through the world beyond |
| Removals: | The plant was Chinese-owned during Japanese occupation. A sign on the gate written in Russian was translated by the Chinese as indicating that the plant was Chinese-owned and should not be disturbed. |

PREPARED BY

H. M. Thorne

# MANCHURIA PULP INDUSTRIAL COMPANY

**Location:** Hailin (near Mutanchiang), Kirin Province

**Note:**

This plant was not inspected. The information given in this report was taken from "The Economic Review of North Eastern District of China" (source considered reliable) and report by Japanese in Tokyo on "Textiles, Paper, and Pulp in Manchuria" (considered fairly reliable).

Due to the fact that there are no production figures available for any years before 1944, this is assumed to be the year it was put into operation.

This plant produced:

(a) Wooden pulp for artificial silk (rayon)
(b) Pulp
(c) Imitation paper
(d) Printing paper
(e) Wrapping paper

The Economic Review lists 2,693 tons of pulp and 513 tons of paper as having been produced in 1944. The plant was equipped with 3 digesters, 1 pulp machine, and 1 paper machine. Employees listed were 190 Japanese and 220 Koreans and Chinese.

This plant was located in the area where the armies of the USSR were reported to have met the most stubborn resistance by the Japanese. Removal of machinery from this plant cannot be confirmed but it can be assumed in the light of inspections made of other plants in this area that there was some machinery removed. The plant itself was believed to have been seen from the train (enroute Mutanchiang - Harbin) and appeared to have been completely wrecked. For further substantiation of this assumption, see Mr. Cleaveland's "Chronological Report of Harbin Trip", Appendix 26.

If the restoration of this plant is possible it seems advisable in the light of "Report on Pulp and Paper Industry" (Source File 11-D-3) wherein it is pointed out that the Northeast District of China must produce 250,000 tons of paper in order to supply the paper demands of China.

The most likely source of raw materials for this plant would be the birch forest between Mutanchiang and Weiho along the boundary between Pinchiang and Mutanchiang Provinces.

The processes used in this plant were probably craft and sulfite.

PREPARED BY: Capt. Earl M. Scott

## MANCHURIA SOYA BEAN STEM PULP MILL

**Location:** Kaiyuan (Liaoyang Province)

**Date Visited:** 16 June 1946

**Description of Product:**

The plant produces wrapping paper, printing paper, and craft paper.

**Best Previous Production and Year:**

Production consistently at a level of 450 tons of paper bags per month and 200 tons of pulp per month throughout the war.

**Plant Equipment:**

1. Equipment for shredding soya bean and "keyeline" stalks and wood. Housed in a four-story building.

2. Seven tanks 35-50' high and 12-20' in diameter for cooking, with 4 reagent tanks.

3. Three dryers of four-ton each batch capacity.

4. Six tanks 10' x 40', vertical cylindrical, for separating out rough parts of the pulp.

5. One paddle wheel mixing trough and one 8' x 20' trough in compartments for mixing and washing.

6. Two sets of storage tanks for pulp.

7. Two rooms 35' x 250' and 55' x 350' with foundation sets for matting reels and paper rolls 12' wide.

8. Machine shop 100' x 50' with bases for 2 large lathes.

9. Foundry room 30' x 50'.

10. Buildings apparently for converting paper to bags, foundation sets for machinery.

11. Buildings for storage, offices, etc.

**Number of Employees at Full Operation:**

There were 600 persons employed in the plant, of whom 300 were

Chinese coolies and 300 were Japanese staff and Japanese and Korean laborers.

### Removals:

Absolutely everything was removed by the Soviets except built-in installations; namely, cooking tanks, reagent tanks, drying furnaces, separation tanks, and bases for heavy lathes. An extension of the plant was under construction where 4 rotating ball cookers 16' in diameter and 4 that were 12' in diameter were in place. Other equipment had not been installed. Dismantling of the plant began on September 28, 1945, and the last shipments were made on November 15, 1945.

### Destruction:

There was nothing left to destroy after the removals except the tanks, dryers, and cookers which were intact.

### Maximum Capacity Considered Practical to Restore:

In view of the fact that only the buildings and a few fixed installations remain, the desirability of restoration would depend entirely on the feasibility of establishing a completely new plant in this location.

### Equipment Needed for Restoration:

Ninety-five per cent of the equipment necessary for a paper and pulp plant and 10 - 20 per cent restoration of buildings.

### Source of Raw Materials:

Kaoliang

The soya bean stalks and "koyoline" stalks came from local sources. The wood was imported from northeastern Manchuria. The same sources would exist in the future.

### Stockpiles:

About 50 carloads of soya bean and "koyoline" stalks were piled outside the plant. There were no stocks of finished product. In fact no samples could be found.

### Former Distribution of Product:

The entire production of this plant was taken over by the paper control board for distribution.

### Names of Russian Officials Handling Removals:

Major Petrov or Petroff; Major Mayupanvu; and Captain Ianchi.

Notes on Process:

So little of the plant remained that it was impossible to determine details of the process and no individuals were present who knew details as Chinese were not permitted to enter the plant and the only Japanese available were non-technical men who had only visited the plant.

Remarks:

This plant was more completely stripped than any I have seen to-date. The following information which is presented for what it is worth was obtained from Mr. King (Chinese) of Kaiyuan, the Magistrate of Kaiyuan, and several members of the Magistrate's staff:

The Soviet troops arrived on September 11, 1945. The Chinese Communists joined them on September 24th. Stripping started on September 28th. The last shipments were made on November 15th. The Soviets departed on March 11, 1946. Pillaging and raping started immediately on September 11, and continued until the end of this occupation. The familiar pattern of (1) Soviet pillaging and raping, followed by (2) Communist pillaging and raping, then encouragement of the local poorer classes to do likewise was followed. One remarkable story was that local coolie population was taken to the Japanese quarters, told to take what they wanted, and as they came out with booty were shot down by Soviet troops. The Soviets took movies of this which were undoubtedly intended for propaganda movies to prove that the local people and not the Soviets did the looting. This falls down due to the physical absence in Manchuria of heavy equipment taken that would be difficult to conceal.

PREPARED BY

T. A. Hendricks

Appendix 13-a

## PAPER ENTERPRISES IN MANCHURIA--1942

| Location | Name of Enterprise | Capital (in 10,000 yen) | Product |
|---|---|---|---|
| Liaoning Province: | | | |
| Antung | Antung Zoshi | 300 | Rice paper |
| " | Asahi Seishi | 130 | Toilet paper and substitute printing paper |
| " | Fuhing Seishi | 15 | Toilet paper |
| " | Jihch'engt'ai Seishi | 28 | Toilet paper |
| " | Nikko Seishi | 15 | Toilet paper |
| " | Oryokko Seishi | 500 | Gloss paper |
| " | Rokugo Seishi | 150 | Printing and simili paper |
| " | Tungchi Seishi | 15 | Toilet paper |
| " | Tunghosheng Seni Kogyo | 18 | Toilet paper |
| " | T'ungiyung Seishi | 13 | Toilet paper |
| Chinchuan | Fuhai Seishi | 4 | Yakigami (parchment) |
| " | Mut'ang Seishi | 12 | Yakigami (parchment) |
| Fushun | Fushun Seishi | 25 | Toilet and substitute printing paper |
| " | Kyowa Seishi | 30 | Toilet paper and substitute printing paper |
| Kaiyuan | Ishunhao Seishi Gomei | 18 | Toilet paper |
| " | Manshu Tokan Parupu | 1000 | Printing paper |
| Mukden | Ashu Seishi | 22 | Yakigami (parchment) |
| " | Manshu Shiko | 200 | Cardboard |
| " | Manshu Seishi | 100 | Manila paper |
| " | Manshu Shigyo Hoten | 19 | Toilet paper and substitute printing paper |
| " | Maruzo Seishi | 150 | Toilet paper and substitute printing paper |
| " | Shenyang Seishi | 30 | Yakigami and toilet paper |
| Yingkou | Kotoku Ashi Parupu | 500 | Manila paper |
| " | Toa Seishi | 30 | Yakigami |
| Kirin Province: | | | |
| Chiu-chan-tun | Kirin Seishi | 2500 | Tissue and oil paper |
| Harbin | Kyowa Seishi | 20 | Yakigami |
| " | Shokoku Seishi | 30 | Yakigami and toilet paper |

| Location | Name of Enterprise | Capital (in 10,000 yen) | Product |
|---|---|---|---|
| Hsinking | Hsinking Seishi | 14 | Toilet paper |
| " | Matsuyama Seishi | 10 | Yakigami and toilet paper |
| Hualin | Manshu Parupu * | 500 | Printing paper |
| Kaishantun | Toho Parupu Kogyo | 3000 | Printing paper |
| Tungchingcheng | Toyo Parupu | 1000 | Printing and substitute craft paper |
| Yingcheng | Manshu Tokushu Seishi | 1000 | Printing and substitute craft paper |
| **Jehol Province:** | | | |
| Chinchou | Chinchou Seishi | 12 | Yakigami |
| " | Chinchou Parupu | 3000 | Simili and gloss paper |
| **Kwantung Leased Territory:** | | | |
| Dairen | Matsuura Seishi | 47 | Toilet paper and substitute printing paper |
| " | Susono Seishi | 5 | Yakigami |

*"parupu" = "pulp"

# KIRIN LUMBER DEVELOPMENT COMPANY

**Location:** No. 23 Bummyo, Jyoyoku, Kirin, Kirin Province

**Date Visited:** 2 July 1946, by John P. Hurndall

**Source and Reliability of Information:**

Information on removals was obtained from the former Japanese Plant Manager. He is considered reliable and the information is regarded as true. Removals were confirmed by inspection.

**Date Placed in Operation:**

29 November 1919

**Description of Product:**

Sawed lumber, furniture, and household products

**Production Prior to 15 August 1945:**

39,600 cubic meters per year

**Plant Equipment as of 15 August 1945:**

(a) 1 prime mover - 120 HP - horizontal type engine
(b) One 100-HP spare engine
(c) 322 five HP electric motors
(d) Approximately 8 bandsaws of various sizes; several disc saws (See Source File 9-0-1 for detailed list).
(e) 8000 cubic meters of logs
(f) 2200 cubic meters of semi-finished products

**Number of Employees:**

250

**Removals:** All equipment and materials on hand removed by Soviet Army; also, 30,000 yen of the company funds. Removals were made during the period August 23 to December 31, 1945.

__Destruction:__ Buildings were destroyed by local populace following removals.

__Source of Lumber:__

Local

__Former Distribution of Product:__

Kirin, Choyo-Chin, Mukden, Fushun, Anshan.

__Remarks:__ The Communist Army attempted to use the plant and are reported to have moved in a few machines. These were observed and consisted of two power saws without motors. The wood flooring of the buildings had been removed by local Chinese. See Source File 9-0-1 for further details.

PREPARED BY

John P. Hurndall

## MUGEN LUMBER COMPANY

**Location:** Kirin, Kirin Province

**Date Visited:** 1 July 1946, by John P. Hurndall

**Source and Reliability of Information:**

Additional information was secured from the former plant manager (Japanese). He is considered reliable and the information is regarded as correct.

**Product:** Cut lumber

**Capacity as of August 15, 1945:**

36,000 cubic meters of lumber

**Plant Equipment as of August 15, 1945:**

Total of 86 pieces of equipment consisting of electric motors, power saws of assorted types, planers, etc.

**Removals:** Plant completely stripped of all equipment plus 20,000 cubic meters of cut lumber by Soviets.

**Destruction:** Buildings badly wrecked by looters for firewood.

**Comments on Restoration:**

Restoration would require complete rebuilding and re-equipping.

**Source of Lumber:** Eastern Sungari River area

**Former Distribution of Product:**

Manchuria

PREPARED BY

John P. Hurndall

U. S. GOVERNMENT PRINTING OFFICE O--1948

GENERAL BOOKBINDING CO.
72 433AA A 30
QUALITY CONTROL MARK
6023

UNIVERSITY OF MICHIGAN
3 9015 02740 8064

THE UNIVERSITY OF MICHIGAN · LIBRARIES · 1817

5:Ahnert N-4

NATUR

NATURAL REGIONS
LOWLAND
SSURI
BUREYA MTS.
NGAN
AMUR-ZEYA PLAIN
IL-KHURI-ALI
RANGE
EASTERN TRANSBAIKALIA
ARGA
SOILS
1 2 2a 3 4 5
6 6a 7-8 12 14